



U N O

PRACTICAL GARDENER,

AND

MODERN HORTICULTURIST,

BY

CHARLES MCINTOSH, C.M.C.H.S.



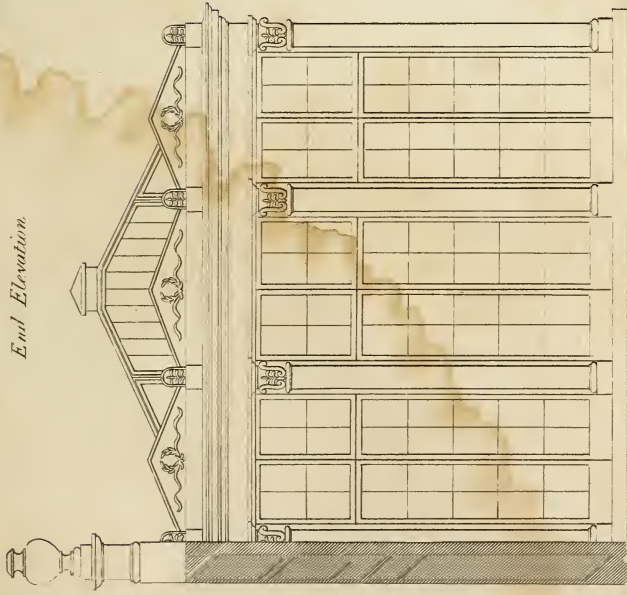
London:

PUBLISHED BY THOMAS KELLY, PATERNOSTER ROW.

1828.

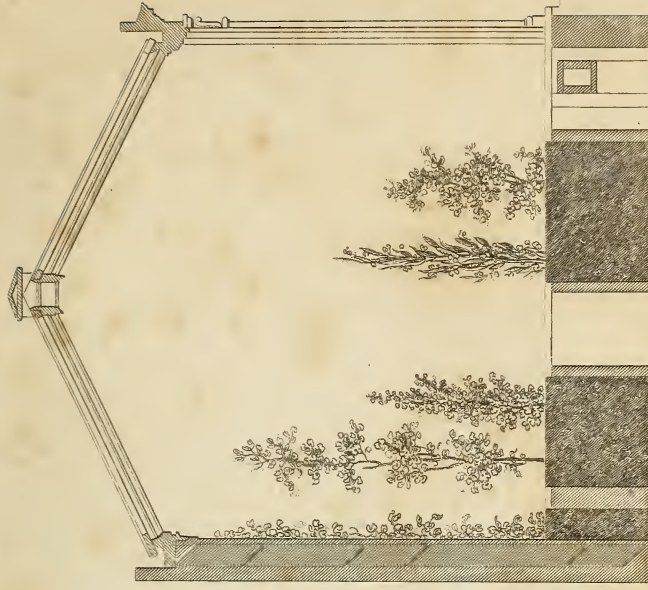
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CULTIVATED IN THIS COUNTRY.

BY CHARLES M^C. INTOSH, C.M.C.H.S.

*Late Gardener to the Right Honorable the Earl of Braedalbane, and Sir Thomas Barry, Bart.,
M.P., &c. &c. and now Head Gardener to the King of Belgium, at Claremont.*

SIXTH EDITION.

VOL. I. *II*

LONDON:

PRINTED FOR THOMAS KELLY, 17, PATERNOSTER ROW.

1836.

P R E F A C E.

AMONGST the various pursuits which occupy the attention of man, whether considered in regard to profit or amusement, few hold a more distinguished place than Horticulture. Even in the primeval ages of the world, before luxury had established its controul over every relation of human life, and the wants and necessities of man were confined to the immediate productions of his native soil, we even then find, that the culture of the garden was one of the primary objects of his industry, and the principal source on which he depended for his subsistence. With the lapse of years, the benefits of Horticulture gradually developed themselves, and the pages of history furnish us with innumerable examples, of the great and important advantages which have resulted to a country, in which its princes and nobility have applied themselves to the study of practical Horticulture, thereby opening fresh sources of national grandeur, and enlarging the sphere of individual prosperity. Grateful, however, as we ought to be to such exalted characters, who, indifferent to the elevated station in which their destiny has placed them, have boldly shaken off the fetters thrown over them by ignorance and prejudice, and have descended from "their high estate" to wield the spade and plough; yet our thanks are still more pre-eminently due to such men as a Bacon, an Evelyn, and a Platt, who have not only, by the transcendant power of their abilities, penetrated into the arcana of agricultural and botanical science, but who have also, by their invaluable writings, transmitted to us the results of their laborious researches, and thereby laid the foundation to those important discoveries in the practical management of the garden for which the present age is so happily distinguished.

Agriculture, and with it its twin-sister, Horticulture, may be considered as the immediate precursors of human civilization; and we find that all nations advanced in general and individual prosperity, in proportion to their progress in, and to their attachment to agricultural pursuits. The native beholds his fields ripening with corn—his vineyards blushing with the grape—the spirit of patriot-

ism arises in him — his love of industry is awakened, and his country is enriched by his labors. Wherever the earth is richly cultivated, there plenty and happiness abound—the desert becomes peopled—the barren waste is transformed into golden fields of corn and the orchards and the gardens teem with their luscious fruits.

Horticulture has, within these few years, made more rapid advances towards perfection, than perhaps any other science, but it is a principle, which cannot be too forcibly and frequently impressed on the mind of those, who undertake the cultivation of a field or garden, that with the possession of mere theoretical knowledge, a positive failure must be the consequence. The knowledge of the management of a garden is not to be obtained by pertinaciously adhering to one particular system, however recommended by high and celebrated names. There are various and other important points to be taken into consideration, the particular knowledge of which is only to be acquired by the most constant perseverance and the most unremitting industry, and by reducing the principles of *theory* to the certain and infallible test of *practice*. But how is this knowledge to be acquired? how is it to be obtained at an expense which the limited income of the gardener or the peasant will enable him to bear? The answer is obvious: it is only to be acquired by closely attending to the rules and precepts laid down by those eminent men, who have made the science of Horticulture their sole study, who have had time and ability to examine the systems and the experiments of others, and who, by their indefatigable industry, have penetrated into the mysteries of nature, and wrested from her, as it were by force, those secrets, which she seemed determined should never be disclosed.

We disclaim all intention of decrying or depreciating the labors of those, who have preceded us in the important task which we have at present undertaken. The systems which they laid down for the management of a garden were probably the most proper, and the best adapted to the limited knowledge and experience of the times in which they lived; but as the spirit of discovery proceeded, and the light of improvement was more generally diffused, the ancient systems gradually gave way, and in process of time were utterly exploded. Were a gardener of the middle of the eighteenth century to be suddenly placed in a garden cultivated on the principles of the present day, his surprise would perhaps be as great as that of the untutored savage on seeing a gigantic fabric moving on the waters of the ocean, impelled by a little steam

arising from a cauldron of boiling water. An Abercromby, a Miller, a M'Phail, and a Nicol, have, it must be acknowledged, contributed much to enlarge the sphere of our horticultural knowledge, and we readily and willingly offer them the meed of merit for the benefit which the country has derived from their labors; it must, however, be admitted, that the channels through which their discoveries and improvements have been hitherto disseminated through the country, are placed beyond the reach of the middling or lower classes, by the great expense with which the purchase of them is attended. The transactions of the Horticultural Society, however valuable and useful they may be to noblemen and gentlemen, are only circulated within the sphere of a chosen few, and are by far too expensive to become the property of persons of moderate fortune. In the purchase of those works, excellent as they may be in their kind, and highly useful as they may prove to the scientific or experimental Horticulturist, the mere simple Gardener, to whom the principles of practice are alone valuable, would find, that to obtain the single grain of corn of which he was in search, he has also bought a mass of extraneous matter, destitute to him of all benefit and utility.

It becomes therefore a desideratum, that a work should be circulated, in which those defects are remedied; in which the entire system of practical science is laid down in the most clear and explicit terms, and in which the nobleman, as well as the more humble operative gardener, may, at one glance, survey the experience and knowledge of the most celebrated practical men, and find those valuable rules laid down for their guidance in the management of their gardens, on which must depend the plenty and excellence of their produce.

The principles which should be particularly attended to in the compilation of such a work, and which will be found to have been invariably adhered to in the present instance, are conciseness, perspicuity, clearness of definition, a total absence of all abstruse and useless terms, and a general attention to the explanation of those minutiae of horticultural science, which must necessarily render a work of this kind so invaluable to every individual, who takes upon himself the management of a garden, whether for amusement or for profit. We discard from our pages all the crude and undigested theories of the mere experimentalist, which only tend to mislead and confuse the mind, and we direct our attention solely to the dissemination of that solid and valuable instruction, by which every class of society, from the nobleman to the peasant, may be initiated

in the practical department of one of the most interesting arts, which can occupy the attention of man.

Horticulture is not confined, at the present day, to a few individuals, who may have selected it as the immediate means of their subsistence; its spirit is transfused into all classes of society; it has become a favorite object of the attention and study of the fair sex, in the most elevated ranks of life. As a source of agreeable domestic recreation, especially to the female sex, few objects stand higher in estimation than the care of a garden. It is a source of health to the valetudinarian; the aspect of his flowers renovates his spirits, and in their balsamic odour he seems to inhale fresh life, and a delightful invigoration of his exhausted frame. What is more pleasing and gratifying to age, when the customary scenes of life have lost their relish, than to spend the evening of his days in the cultivation and amusement of a garden? he looks on his flowers as his children, and in their bloom and blossom feels himself young again. A taste for gardening, unlike all other tastes, diminishes not as we advance in years; it lives with us to the last hour, and it is our last wish, that the flowers which we have reared, should be strewn on our grave.

The gardens of the great were formerly under the sole control of a well-educated scientific man, but now we see the peeress directing the management of her own gardens and green-houses, by the force of her own knowledge and experience; we see her ransacking the most distant quarters of the world for those beautiful exotics, which are now the pride and beauty of our gardens; we see the opulent merchant, after a meritorious life spent in the harassing and uncertain walks of commerce, retiring to his suburban retreat, and there passing the evening of his life in the cultivation of his garden, or the management of his hot-houses. We see the peasant, after the labor of the day is over, recreating himself in the cultivation of his garden, that pride and boast of an English cottage: in fine, whithersoever we direct our view, we behold the spirit of Horticulture pervading every rank in life; it decorates the table of the nobleman with the luscious pine—it cheers the frugal board of the peasant with wholesome vegetables. If we direct our attention to the general aspect of the country, how much has the spirit of Horticulture contributed to its present beautified condition. Where the steps of our forefathers trod over wastes and wilds, now smiles the garden, with its fruits and flowers. There is scarcely a spot in the remotest parts of England, in the dells of Wales, or the glens of Scotland, in which the effects of

the spade are not to be seen : it may be said, in fact, to have civilized the country ; it has endeared the peasant to his native soil ; it has opened to him a never-failing source of sustenance, at once prolific and wholesome, and it has imparted to him a spirit of pride and emulation, which enables him to surmount the cares and privations of a dependant life.

Partial, however, as we must naturally be supposed to be to our own individual mode of practice, as having been the result of a long-tried experience, we are by no means insensible to the merits of the various methods of management adopted by others, nor do we treat with indifference many late valuable inventions and discoveries, by which the operations of the garden are facilitated, and ultimate success more decidedly insured. In our exposition, however, of the practice and inventions of others, we beg not to be considered as giving our unqualified approval of their excellence or superiority over the method recommended by ourselves ; but in a work of general practical utility, which this especially professes to be, we might expose ourselves to the imputation of partiality and prejudice, and even of ignorance, were we to exclude from our pages all mention of the different methods of management at present adopted by several eminent Horticulturists, and which, in many instances, are in reality founded on the most acknowledged principles of practical science. The positive and apparent advantages of each method are fully and impartially exhibited, and the option is thereby given to every individual, to adopt that particular one, which is most congenial to his taste and condition in life.

With the view of rendering this work more practically useful and perfect than some others which have preceded it, and which cannot fail to recommend it to the serious attention of every Horticulturist, it will be sufficient to enumerate the following subjects, which will come under discussion, the value of which cannot be too highly appreciated by every individual, who may contemplate the design of establishing a garden, either on a large or a limited scale.

The cultivation of culinary vegetables is the primary object of attention of every Gardener. In this work their mode of culture is exhibited, according to the latest approved system, arranged for every month in the year, at the same time that a specification is given of the choicest sorts, famed for the excellence of their flavor, or the abundance of their supply. The Fruit-garden is next in consideration, and therein we profess to give the most ample instruction for the management of our native fruits, accompanied by a new systematic catalogue of all their varieties and sub-varieties, as a

guide to those, who may be desirous to obtain the choicest fruits, either as an ornament to the table, or as an article of commerce. Under the respective departments of the Hot-house, the Green-house, the Conservatory and Forcing-garden, the latest improvements in their management are displayed, exemplified by drawings of many valuable modern inventions for facilitating their respective operations. In the former department, the new system of heating forcing-houses by hot water is fully exhibited, accompanied by appropriate designs for the erection of the necessary apparatus. Our subordinate departments will treat of the nature of Soils—the application of Manures—the choice of situations for Gardens—the grafting and pruning of Trees—with every other topic connected with the practical management of a Garden.

The illustrative department of this Work will be enriched with engravings, executed in a superior style, of some of the choicest fruits and flowers, drawn and colored *ad vivam*, constituting itself a highly recommendatory feature, at the same time that it must prove of acknowledged importance to the Florist and the Pomonologist.

Having thus particularized the leading features of our Work, we confidently submit ourselves to the impartial decision of the Public, for the style and manner in which the various departments have been executed. Our claim to their approbation and patronage is founded on the production of a work, combining in itself the soundest principles of modern practice, with the latest improvements and discoveries of the most refined science. With our view constantly directed to the diffusion of useful, practical information, we have been equally attentive to those branches, which depend on ornament for their excellence, or which require in their management a higher degree of professional skill. To attain perfection belongs not to the human character, but in proportion as it is approached, so is the meed of approbation which should be awarded; it is by that standard that we are willing to be judged, and if by our efforts we have made a single blade of grass to grow where none grew before,—if we have awakened in a single individual, whether of high or low degree, a love and taste for the benefits and beauties of a garden,—if we have exploded a single erroneous custom in the practical department of Horticulture, or have simplified any of the difficult branches of the art, the principal objects of our labor have been attained, and we may say with the elegant writer of antiquity, that

“ FINIS CORONAT OPUS.”

THE
RISE AND PROGRESS
OF
GARDENING,

FROM THE EARLIEST PERIOD TO THE PRESENT TIME.

GARDENING, if not the most useful, is undoubtedly the most ancient of all arts: the sacred historian informs us, that the Almighty had no sooner created the universe, than he planted a garden eastward in Eden, and after this garden was finished, "The Lord God took the man, and put him into the garden of Eden, to dress it, and to keep it." This may be considered as the first account which we have in sacred history of the origin of gardens; although, in fabulous and profane history, we have many vague accounts of gardens, without conveying to us any positive information respecting their produce and cultivation.

We have no farther account of gardening in the antediluvian world, with the exception of the immediate results of the transgressions of our first parents, who, for their disobedience, were not only themselves thrust out of the garden of Eden, and doomed to till the sterile ground by the sweat of their brow, but also entailed a lasting curse upon all their posterity.

Soon after the general deluge, the Mosaic history informs us, that Noah no sooner found the earth in a state fit for cultivation, than he became a husbandman and planted a vineyard, and most probably a garden, and made wine.

Frequent mention is made by the same historian of vineyards, which were the gardens of those days, being cultivated by the majority of the people, through whose lands the children of Israel passed on their journey to the promised land.

Several gardens, belonging to Jewish princes and their subjects, are mentioned in the sacred Scriptures; but that of Solomon is the principal on record. Solomon was not only a cultivator of a garden, but is also the first person recorded in history in the character of a botanist. He is said to have been acquainted with all trees, "from the cedar of Lebanon, to the hyssop which springeth out of the wall."

The garden of Solomon was quadrangular, enclosed by a high wall, and contained, among other plants, the rose, the lilly of the valley, calamus, camphire, spikenard, saffron, and cinnamon; timber-trees, as the cedar, the pine, and the fir; and fruits, such as the grape, fig, apple, palm, and pomegranate. It also contained water, in wells and living streams, and the situation, in all probability, was contiguous to the palace, similar to the gardens of some of his successors.

Solomon had also a vineyard at Baalhamon, which he let out at one thousand pieces of silver, or £158. sterling, per annum.

Ahasuerus, also, had a garden near his palace, although we have no further account of it than that he returned out of the palace-garden into the place of the banquet of wine, where the queen was. (*Esther* vii. 7, 8.)

Ahab wished to have the vineyard of Naboth, the Jezreelite, to make it a garden of herbs, because it was contiguous to his palace. Upon being refused, he was very sorrowful, but his wife Jezebel found means to impeach Naboth, by false witnesses, of treason, and caused him to be stoned to death, and then delivered the desired vineyard into the hands of her husband.

Many other gardens are mentioned both in the Old and New Testaments, sufficient to bear ample testimony of the importance in which they were held by the Jews, and the people immediately connected with them.

Our account of the horticulture of the antient Jews is very imperfect; but, like that of the majority of the eastern nations,

it was probably upon the same plan as is still adopted in Canaan, which is principally directed to the cultivation of cooling fruits, for the purpose of allaying thirst, and moderating the heat of the climate; aromatic herbs were also cultivated to give a tone to the stomach, and wine was made to refresh and invigorate the spirits. Their gardens, according to the most authentic information, produced cucumbers, melons, gourds, onions, leeks, garlick, anise, cummin, coriander, mustard, and various spices. Cucumbers, melons, leeks, and garlick were eaten in Egypt, and the cultivation of them was probably continued as long as the Egyptians remained a powerful people.

In the 2d chap. of Numbers, ver. 5, we find them murmuring to Moses at the want of these fruits and vegetables.

The gardens of the Hesperides are the next in antiquity to that of Eden, and were situated in Africa, near Mount Atlas, or, according to others, near Cyrenaica. They are described by a geographer of the sixth century before Christ, as being situated in a place eighteen fathoms deep, with an acclivity on all sides, and two stadia in diameter, covered with a variety of trees planted closely and thickly interwoven. The most noted fruits of this garden were the golden apples, supposed to have been oranges, which Hercules carried off by stratagem, although guarded by a dreadful dragon, which never slept. Independently of these apple-trees, many other ornamental trees and shrubs grew in this garden, such as olives, almonds, mulberries, arbutus, ivy, and myrtle.

The promised garden of Mahomet is the next in notoriety, of which we have any traditionary account, and it was the heaven of his religion. The pleasures of temporal gardens, which we so much covet and admire, are but of momentary consideration, compared with their duration in the gardens of Mahomet, which, to all true believers, were to last for one thousand years.

Having thus given a cursory detail of the gardens of the primary ages of the world, we will now proceed to a short review of those gardens of antiquity, of which an historical account is handed down to us by the Greek and Latin historians.

The garden of Alcinous is supposed to have been situated in an island of that name ; but by some it is considered to be Corfu, in the Ionian Sea, and by others, with more probability, an Asiatic island.

It has been remarked by Sir William Temple, that this description contains all the justest rules and provisions which are requisite for the construction of the most perfect garden. The extent of the garden of Alcinous was, in those days of simplicity, looked on as great, even for a prince. It was enclosed to protect it from depredations, and, for conveniency, was placed near the gates of the palace.

This is the first garden, according to Harte, that we read of in ancient history. It contained only three or four kinds of fruit-trees, a few beds of culinary vegetables, and a small number of flowers. It contained two wells, one for the use of the garden, and the other for the palace.

The gardens of Laertes, described by Virgil, appear to have been nearly similar to that of Alcinous, but more varied in its productions. So attached was Laertes to his garden, that when his son Ulysses paid him a visit, he describes him to be found no where but in his garden, "attended by his servants, gathering shrubs to make a hedge, and the old man directing them, and weeding the plants with gloves on, because of the bushes."

The celebrated gardens of Babylon, commonly called the hanging-gardens, so celebrated among the Greeks, on account of their being elevated, according to some historians, upon vast blocks of stone, supported by pillars of the same material. These gardens are described by Strabo and Diodorus, as containing a square of four hundred feet on each side, giving an area of nearly four acres, and were carried to a considerable elevation, in the manner of several large terraces, one appearing incumbent on the other, till the height equalled that of the walls of the city. The ascent was from terrace to terrace by stairs ten feet wide. The whole pile was sustained by vast arches, raised upon other arches, one above the other, and strengthened by a wall of twenty-two feet in thickness, that surrounded it on every side. Large flat stones, sixteen feet long and four broad, were first laid on the top of the arches ;

over these was a layer of reed, mixed with a great quantity of bitumen, on which were two rows of bricks, closely cemented with plaster. The whole was covered with thick sheets of lead, on which the mould of the gardens was deposited, which was so deep, that the largest trees could take root in it, and with these the terraces were covered, as well as with plants and flowers.

These extraordinary and elevated gardens were built by Nebuchadnezzar, for the purpose of gratifying his queen Amistis, who, being a native of Media, could not be reconciled to the flat appearance of Babylon, which, for many miles round, was an immense level space; and Media, her native country, being rather hilly, and presenting that undulation of surface, which has always been considered an indispensable beauty in landscape. This is the first instance we have on record of any attempt to give to a level surface that undulating effect which is so much admired in nature. It is therefore probable, from the above circumstance, that landscape-gardening had been studied in Media to some extent, and that the queen of Nebuchadnezzar had not been altogether an inattentive observer of the beauties of landscape. The erection of these gardens, from whatever motive they may have been erected, reflects greater credit on this king than any other action of his life.

We have another instance, of nearly the same date, of the preference given to lofty situations for gardens. Diodorus Siculus observes, "When Semiramis came to Chanon, a city of Media, she discovered on an elevated plane a rock of stupendous height, and of considerable extent. Here she erected another garden, exceedingly large, enclosing a rock in the midst of it, on which she erected sumptuous buildings for pleasure, commanding a view both of the plantations and encampments." This Amazonian queen had, it appears, a taste for gardening as well as for war.

Cyrus, the younger, was a great patron of gardening in Persia; and in whatever part of his dominions he fixed his residence, he carefully cultivated and established gardens. Plutarch informs us, that Lysander, the Spartan general, found Cyrus cultivating his garden with his own hands at

Sardis; he was informed by Cyrus that the arrangement of his garden was entirely his own work, and that many of the trees were planted by himself. Lysander was astonished to hear this, and expressing his surprise to the king, Cyrus said, "Do you wonder at this, Lysander? I swear, by the diadem I wear, that if I be in health, I never eat any food until I have exercised my body till I perspire, sometimes in martial exercises, at other times in gardening, or similar laborious exercises of husbandry."

Cyrus had many gardens: one of them, at Celenæ, was of such extent, that he mustered the Grecian forces, to the number of thirteen thousand men, in it. Gardening must, therefore, have been reduced to a regular science, under such a patron as Cyrus, and we are informed by Pliny, that, in the Persian gardens, the trees were planted in straight lines, and regular figures. Among their trees, the Oriental plane, and, what may appear to us remarkable, the narrow-leaved elm, (now called English,) held a conspicuous place. Odoriferous plants, such as roses, violets, &c., were planted along the margins of the walks.

Epicurus, among the Greeks, delighted in the pleasures of the garden, and he chose one for the spot in which to teach his philosophy. Among the flowers cultivated by the Greeks were the narcissus, violet, and rose.

Lord Bacon and W. Mason considered gardening as rather neglected among the Greeks, notwithstanding the progress of the sister art of architecture, which gave rise to his lordship's remark, "That when ages grow to civility and elegance, men come to build stately sooner than to garden finely; as if gardening were the greater perfection."

The garden of Tarquinius Superbus, five hundred and four years before Christ, is mentioned by Livy and Dionysius Halicarnassus, as among the first in the annals of Roman history. It adjoined the royal palace, and abounded chiefly with roses and poppies.

The next in rotation was that of Lucullus, near Baiæ, in the bay of Naples. In this garden, the peach, cherry, and apricot, were first introduced from the East, and were probably brought by Lucullus himself on his return from one of

his expeditions from the eastern part of Asia, where it is most likely that he contracted a taste for gardening.

In the gardens of the Augustan age, Virgil describes the chicory, cucumber, ivy, acanthus, myrtle, narcissus, and rose; but of the progress of gardening in this age, tradition is very silent. From Cicero and Pliny the elder, we learn, that the quincunx manner of planting trees was then generally in use; and by Martial we are informed, that the clipping of trees was introduced by Cneus Matius, a friend of Augustus.

That which has been termed the Dutch style of gardening was used about this time, and it is supposed to have been the style adopted by Pliny, in the formation of his garden, and it was used in this country in the reigns of King William and of Queen Elizabeth, specimens of which still remain, the most perfect of which is at Holm-Court, in Herefordshire, and is supposed to have been laid out by Loudon and Wise. This taste, displayed by Pliny, appears to have prevailed until the decline of the Roman empire, and, owing to its having been displayed in a minor degree in the gardens of religious houses during the dark ages, as well as in the writings of Pliny, has thus been handed down to modern times. "Every country-house," says the Roman historian, "had its gardens in the days of Pliny; and it is not too much, taking this circumstance in connection with the remarks of Columella, to hazard a conjecture, that even the Romans themselves considered their gardens less perfect than their houses."

The following fruits were introduced into Italy by the Romans, viz.: the peach from Persia, the fig from Syria, the pomegranate from Africa, the citron from Media, the apricot from Epirus, cherries from Pontus, and apples, pears, and plums from Armenia. Hirshfield observes: "The rarity and beauty of these trees, joined to the delicious taste of their fruits, must have enchanted the Romans, especially on their first introduction, and rendered ravishing to the sight, gardens which became insensibly embellished with the many productions which were poured into them from Greece, Asia, and Africa." They also attempted, with considerable success, the forcing of fruits. Sir Joseph Banks conjectures, from the Epigrams of Martial,

that both grapes and peaches were forced ; and Pliny says that, by means of *specularia*, or plates of the *lapis specularis*, Tiberius had cucumbers in his garden throughout the year.

For a long period after the fall of the Roman empire, gardening, as well as all other arts, fell into decay, and would possibly have been almost forgotten, had not the monks, who were the only class of men whose particular station in life enabled them to accomplish the undertaking, continued to cultivate the fruits of the earth. Their sacred profession secured them from open violence, and the secluded life which they generally led, enabled them to devote a considerable portion of their time to horticultural pursuits, and which they found conduced both to their health and comfort. Many of the old pear-trees growing at this day, were planted by the monks, and some of the early sorts were introduced into this country by them from different parts of the continent, and are to be found in some of the monastic gardens at the present time.

In Italy, gardening was revived about the beginning of the sixteenth century, under the patronage of the Medici family. Their gardens were generally in the geometric style, similar to those of Pliny, and they continued in that form till about the middle of the last century, when a style more agreeable to nature was introduced. About the beginning of the sixteenth century, the taste for distributing statues, &c. in the gardens, was re-established ; and about the end of the same century, hydraulic devices were introduced, for which the gardens at Tivoli were so distinguished.

About the beginning of the seventeenth century, the formal and stiff square-clipt hedges, straight walks, and trees uniformly lopped, formed the distinguishing features of a fine Italian garden. Since that period, gardening has progressively improved in Italy ; but the Italians are still far behind this country in horticulture, although they have one of the finest climates in the world in their favor.

The Dutch have long been celebrated for their skill in the culture of flowers, and this taste is thought to have originated with their industry, about the beginning of the twelfth century ; the study of flowers being in some degree necessary, in affording patterns for the ornamental linen and lace manufactories.

The Dutch being a maritime people, were amongst the most early introducers of plants from the Levant and from the two Indies; and their gardens contained, at one period, a much greater number of plants than all the rest of Europe combined. The civil wars, however, which desolated that country in the sixteenth century, were also the cause of the destruction of their gardens. It was in the Botanic garden of Leyden that Boerhaave, who was then Professor of Botany, first exemplified the principle for adjusting the slope of the glass of hot-houses, so as to admit the greatest number of the sun's rays, according to the latitude of the place, &c. It was in this garden that the two numerous genera of the geraniums and mesembryanthemums were first introduced from the Cape. As Holland is not well supplied with gravel, the walks of this garden are laid with a mixture of peat-moss, and rotten bark reduced to a powder.

The Dutch have been long, and are still noted for their skill in the cultivation of bulbs of all sorts. Hirschfield states that, in the register of the city of Alkmaar, in the year 1637, it is recorded that one hundred and twenty tulips, with their offsets, were sold publicly, for the benefit of the Orphan Hospital, for nine thousand florins, and that one of those flowers, named the Victory, sold for four thousand two hundred and three florins. The prices given for such flowers appear enormous, but now they are not so high as formerly; the highest price demanded for the most rare being about one hundred guilders, or eight pounds two shillings and sixpence for each bulb.

The Dutch and Flemings are eminent as fruit-gardeners as well as florists; and they possess many fine varieties of fruits, particularly pears. Culinary vegetables are also brought to great perfection; and Brussels is particularly noted for a species of greens or sprouts, which bear the name of that town, and which have been long cultivated in its vicinity. The gardens of the cottagers in the Netherlands are much better managed, and more productive, than in any other country. Every cottage has a garden attached to it, and every available particle of matter capable of acting as a manure is collected, and when properly ameliorated by repeated turning and frequent fermentations, is applied to the ground. The plants in

general cultivation are the cabbage tribes, including the Brussels sprout, white beet, parsnep, carrots, yellow and white turnips, peas, beans, kidney-beans, potatoes, &c.: the fruits are currants, apples, and pears, and the vines are often trained upon their cottages. Their flowers are double wall-flowers, rockets, stocks, pinks, roses, and honey-suckles.

Gardening in France was little attended to before the eighth century, when Charlemagne introduced some particular fruits, and recommended the use of vineyards and orchards. Louis the Fourteenth, about the middle of the seventeenth century, introduced splendour in design; and about the close of the eighteenth century, English gardening began to be adopted in France, and was pursued for a time with considerable enthusiasm. The works of the French on gardening are luminous, and exhibit an enlarged knowledge of the subject, but the charge against them is not without foundation, that their practice has not kept pace with the science which their writings display. English gardening in France, during the Consulate was little attended to; several places were, however, laid out or altered by Blaikie. Since the Revolution little has been done in the way of improvement: the unsettled state of the people may be some excuse.

Few cottagers in France are without their little gardens, and they display, particularly in the northern parts, considerable neatness in the management of them. The gardeners of the nobility, for the most part, are very illiterate, and ignorant of the first and most common principles of their profession: they are no better than the common labourers employed in digging an English garden; and, under such circumstances, gardening cannot be expected to make any rapid strides towards perfection.

Buffon, the celebrated naturalist, was so enamoured with his garden, that he erected a pavilion in it, in which he could study without interruption. To this retreat this great man daily retired at five o'clock in the morning, and was then inaccessible to all visitors. This retreat was justly styled the cradle of natural history, by Prince Henry of Prussia.

Gardening is supposed to have been introduced into Germany, Austria, Prussia, Saxony, and Denmark, by the Romans, and after the decline of that empire, preserved by the monks, who,

during the dark ages, were domiciliated in different parts of the Roman empire, and who, in their dispersion in the distant countries of Europe, carried with them many of the seeds and plants of the best indigenous fruits of Italy.

Horticulture appears to have revived under Augustus the Second, elector of Saxony, who is reported to have augmented the varieties of fruits, and to have planted the first vineyard. The Germans are particularly fond of the different sorts of cabbages and borecoles, of which they make a variety of dishes, particularly broths and soups; they also preserve them salted and fermented for winter use, under the name of *sauerkraut*. In the cottage gardens of Germany little else is grown than the cabbage-tribe, particularly reed-greens and potatoes; this resembles much the productions and uses of a Scotch cottage garden. A taste for flowers is by no means general among them.

By what means, or at what time, gardening was introduced into Switzerland, we have no accounts; but the probability exists, that it took place at an early period. The Swiss took the Romans in Italy as their guide; and their present mode of culture differs little from that adopted by their instructors. They are diligent cultivators of the ground, and have their vineyards and orchards in tolerably good perfection. In their culinary gardens, the cabbage, potato, and white beet are cultivated; kidney-beans and peas they also grow in considerable quantities. The cottagers pay a laudable attention to the management of bees, which yields them a handsome profit. This ought to be more attended to by our cottagers, as the certain means of rendering them less dependent on the landed agriculturist, whose contracted and narrow mind, in too many cases, fancies it to be his interest to keep his peasantry in a state of the most abject submission by nailing them to the soil, or, in other words, keeping them in that state of wretched pauperism, that they are no more their own masters than the slaves on an estate in the West-Indies, and thus at once defeat all their exertions, and remove every stimulus either to the exercise of habits of industry, or to the promotion of their personal welfare.

Gustavus Adolphus of Sweden, appears to have encou-

raged horticulture in that country and in Norway, before whose time little progress had been made in either country in any branch of agricultural science. At a subsequent period, Charles the Twelfth procured several plans from the celebrated French gardener, Le Notre, and various kinds of trees and plants were sent from Paris to Stockholm. The greater part of our common culinary vegetables are now cultivated in Sweden, and even in many parts of Lapland, where the climate is not too inclement.

About the beginning of the eighteenth century, Peter the Great of Russia, applied himself to the study of horticultural science, as well as to that of the other arts which were introduced into this country by that great man, and which laid the foundation of the present power and prosperity of that extensive empire. Peter seems to have adopted the geometric style, or that which had been previously the style of the gardens of Pliny, and in this undertaking he was probably assisted by Dutch gardeners, whose method he had seen and approved during his residence in their country. The Empress Catherine, towards the latter end of the same century, introduced a more modern style, in which she appears to have given the preference to the English, for which purpose she procured an English gardener, who only a few years ago returned from Russia, and died in his native land at an advanced age.

Catherine the Second established the first botanic garden at Petersburg, for the use of the Academy of Sciences; and it was under the auspices of this Empress that the celebrated gardens of Peterhof and Zsarkoe-Seloe were established. In point of extent and ornamental decoration, the former stand unrivalled, and will remain a perpetual monument of the power and perseverance of man in combating, and eventually overcoming the numerous obstacles which Nature frequently throws in the way of the accomplishment of his plans.

The climate of Russia is not favorable for horticultural purposes, but it is astonishing to observe the quantity of fruits and vegetables which are annually reared in the Russian hot-houses.

English gardening was introduced into Poland about the end of the eighteenth century, by the Princess Isabella

Czartoryska, who also wrote a small treatise on the manner of planting English gardens, and which was published at the commencement of the present century. She resided some time in this country, and cultivated a taste for gardening, which enabled her, on her return, to make considerable improvements in her own country. Horticulture is, however, still at a very low ebb in Poland, being chiefly confined to the nobility, who may have taken up a temporary residence in this country, and imbibed a taste for gardening, or who, by serving in the army in France and Germany, may have obtained a knowledge of the systems adopted in those countries.

The study of plants is of great antiquity in Spain; having been introduced by the Arabs, who, at an early period, were acquainted with, and initiated in the study of botany and physic. No country has enjoyed more favorable opportunities of excelling in the cultivation of exotic plants than Spain. The climate is salubrious and temperate, and the Spaniards might have monopolized for a time all the vegetable treasures of Peru, Mexico, and Chili. Culinary gardening requires little skill in Spain, the soil and climate being particularly adapted for it. Onions and water-melons are grown in such plenty as to form a considerable branch of the export trade of that country. Onions and garlic are their favorite vegetables. No European country is so well stocked with a variety of fruits; and, independently of all the fruits of Italy, native or acclimated, they possess the date, the tamarind, and other West-Indian fruits; and in some of the southern provinces, the pine-apple flourishes in the open air. Gardening in Portugal is very little attended to, and is nearly in the same degraded state as it is in Spain.

Having thus entered cursorily into a concise review of the horticulture of Europe, we will now proceed to inquire into the state of gardening in Britain, with reference to its introduction and progress.

Before the Roman invasion, the Britons were so deeply immersed in ignorance, that they cannot even be supposed to have cultivated any vegetable productions, being content to live on acorns, the bark of trees, and whatever other roots

they could pick up by accident. Dio Cassius informs us, that they had ready, on all occasions, a certain kind of food, of which, if they took but the size of a bean, they were not troubled with either hunger or thirst for a considerable time : this is supposed to have been the roots of the *Orobis tuberosus*, the *Carneil* of the ancient Gauls and modern Highlanders. History informs us, that the soldiers of Cæsar were often reduced to the necessity of subsisting upon the same roots for food.

From the remains of Roman villas discovered in many parts of Britain, we are left to conclude, that the system of gardening practised by the Romans, was adopted, both for ornament and use, by the generals and others of the Roman nobles, who accompanied the several expeditions into this country. Pliny expressly says, that cherries were introduced by the Romans about the middle of the first century; and that the vine was also introduced is evident, for Tacitus says, that wine was made on Britain towards the end of the third century, under the Emperor Probus. It is also probable that they introduced some of the onion tribe, and likely some of the brassica, in their then cultivated state; and that they rendered, by cultivation, the *brassica oleracia* of our shores an article of food, as, in some of the oldest records, both kale and leeks are mentioned.

When the Romans abandoned this country to support the tottering fabric of their own empire, it is probable that gardening was quite neglected; as the Saxons, who succeeded them, had little time or taste for rural affairs. It is evident, from historical documents, that horticulture met with some encouragement under William the Conqueror, who may be supposed to have attained to some partial knowledge of it on the continent, where it had flourished under the patronage of Charlemagne.

It is generally supposed that the majority of our fruits, particularly apples and pears, were introduced into this country by the monks, in the days of their greatest luxury and splendor, and it is probable that the indigenous fruits of this island were cultivated in the monastic gardens. Vineyards and orchards were planted by them, in every place in which they

domiciliated themselves, if the situation were at all favorable. Many of these orchards remain to this time in a sufficient state of preservation to prove to us, that they were planted by people who cultivated them upon good and scientific principles. One in particular is still remaining at Holm-Lacy in Herefordshire, where the trees are in a very healthy state, and yield sufficient crops to render them a valuable acquisition to the clergyman, in whose garden the greater number of them now flourish. It was in this place that William Fitz-swain, in the reign of Henry the Third, founded a Premonstratensian canonry, and it was by the residentiary canons that this orchard was planted. One pear-tree in particular deserves mention, which has been proved to have produced four hundred and forty bushels of fruit in one season, and that fruit produced fifteen hogsheads of perry, of one hundred and twenty gallons each.

Other instances occur of trees of equal age still flourishing with vigour, and bearing an abundance of fruit. In an orchard on the Braedalbane estates, on the margin of Loch Tay, one tree still remains, which is similar to the tree at Holm-Lacy, not only in the abundance of its produce, but is also exactly the same sort of pear, and has in all likelihood stood there since the orchard was first planted, which we find was effected by the Queen of Alexander the Third, of Scotland, who brought a convent of nuns from Scoone, and built a nunnery on the island, of which the remains are still to be seen. These trees, if we may use the expression, have stood their allotted time in their natural or original position; and when overtaken by old age, have laid themselves prostrate on the ground, and from their old trunks and layers branches have emitted roots, and their lateral branches have taken a perpendicular direction, and in their turn have become large trees, like the Phoenix out of the ashes of its parent.

The longevity of the pear is perhaps only exceeded by that of the oak, the chestnut, and the cedar, at least it attains to a greater age than any other fruit-tree with which we are acquainted. These old pear-trees have adopted a rather uncommon mode of propagation, or rather prolongation of their

existence; for when the trunk is no longer able to support the branches, and the sap rises slowly and scantily to their support, they bend at length to their native earth, to renew their own existence in the progeny which they send forth. Nature, in many cases, immediately before dissolution, makes one grand effort to propagate the species, and this is obvious in old trees being greater bearers than the younger ones; and also, that trees in a sickly state often die when loaded with fruit. In this instance, the pear-tree, as if loth to relinquish the vital spark, makes a grand effort, and by striking root from its larger members, wherever they touch the ground, becomes, as it were, young again; and upon the same principle, its existence may be prolonged till the end of time, and an immense space be covered by its branches. The large tree at Holm-Lacy, already alluded to, covers nearly a quarter of an acre.

The first account we have in history of gardening in Britain, belongs to the twelfth century, in which Brithnod, first Abbot of Ely, is celebrated for his skill in forming the extensive gardens and orchards of that monastery, which he stocked with a great variety of herbs, shrubs, and fruit-trees. This monastery may be considered as the cradle of the art of grafting, as it was there first practised by Brithnod, who probably had either learned the art in Italy, or had been instructed in it by some brother ecclesiastic who had emigrated from that country. In Scotland, at this early period, David the First had a garden at the base of Edinburgh Castle. This king had an opportunity of observing the gardens of England under Henry the First, when Norman gardening was prevalent; and it is probable that that king was prompted by his genius to combine elegance with utility in the establishment and cultivation of his gardens.

William of Malmsbury speaks of a considerable number of orchards and vineyards being in the vale of Gloucester. In the year one thousand one hundred and forty, we find that a vineyard was planted at Edmondsbury, for the use of the monks of that monastery.

In the year one thousand two hundred and ninety-four, the monks of Dunstable were at considerable expense in repairing

the walls of their garden and herbary; and about this time several kinds of fruits were in active cultivation. Mathew Paris, speaking of the backwardness of the season at this period, says, that "apples were scarce, pears still scarcer, but that cherries, plums, figs, and all kinds of fruits included in shells, were almost quite destroyed."

Till about the beginning of the reign of Henry the Eighth, many of the now more common culinary vegetables, such as cabbages, &c., were imported from the Netherlands. It was not, says Hume, till the end of the reign of that king that any salads, carrots, turnips, or other edible roots, were produced in England, their culture not being properly understood. About the end of this reign, some progress had been made in the cultivation of vegetables and fruits; for we are informed that the king's gardener introduced musk-melons, apricots, and Corinth grapes, and also that at the same period different kinds of salads, herbs, and esculent roots, were brought for the first time from Flanders. About this time, a taste for florists' flowers began to be cultivated in England, and it is supposed that they were introduced into this country from Flanders, by the worsted manufacturers, during the persecutions of Philip the Second. It was also to the cruelties of the Duke of Alva that we are indebted for receiving, through the same channel, July flowers, carnations, and Provence roses. Flowers and shrubs appear, however, to have been long known and prized before this time.

Henry had a garden at his palace of Nonsuch, in Surrey, which was enclosed with a wall fourteen feet high, and in which the Kentish cherry was first cultivated in England. During the succeeding reign of Elizabeth, gardening appears to have made some farther progress, and it was at this period that the tulip, the damask and musk roses, were first introduced. Elizabeth is said to have been attached to flowers; and Gerrard published his herbal, in which he mentions a London apothecary, who was celebrated for growing tulips, and rearing new varieties every year. Botanic gardens now began to be established; that of the Duke of Somerset, at Sion-House, seems to have been the first. Sir Walter Raleigh introduced the potato and tobacco about this time; and many

other eminent persons now began to collect different varieties of fruits and vegetables from all parts of the world. During this reign, Hatfield, Holland-House, and many other noted places, were planted, and considerable attention paid to landscape gardening. The pleasure-garden appears to have been reserved for Elizabeth's reign, when a square parterre was enclosed with walls, scooped into fountains, and heaved into terraces. During this Princess's reign, there was an Italian who visited England, and published, in 1586, a thick volume of Latin poems, in one of which, called the *Royal Garden*, he describes a labyrinth, and hints at Her Majesty being curious in flowers.

Charles the First appears to have been the first monarch who patronized gardening to any extent in this country. His kitchen gardener was Tradescant, a Dutchman; and Parkinson was his botanic gardener, or herbalist, who was the first author, according to Mr. Neill, of any thing like an original work on English gardening. Cauliflowers and celery were then as great rarities as peas in the time of Henry the Eighth; potatoes were then rare, and the Jerusalem artichoke was in common use. Parkinson describes 58 sorts of apples, 64 of pears, 61 plums, 21 peaches, 5 nectarines, 6 apricots, 36 cherries, 23 vines, 3 figs, with quinces, medlars, almonds, walnuts, filberts, and the common small fruits: an amazing catalogue of fruits for those days.

About this time, florists' flowers were cultivated among all the manufacturing people of Norwich, London, Manchester, Bolton, &c. Oranges and myrtles were cultivated at Kew, Ham-house, &c.; and the larch, which now rears its head on almost every bleak mountain in Scotland, was then a greenhouse shrub, and kept as a curiosity, and the almost equally hardy laurel was then protected from the nipping frosts of winter by being covered over with a blanket.

Cromwell was a great promoter of agriculture and gardening; and his soldiers, whithersoever they went, introduced all the latest improvements in those two important and profitable branches of human industry. They introduced cabbages into the north of Scotland, when quartered at Inverness.

After the restoration of Charles the Second, that monarch

introduced French gardening; and, to carry his plans into execution, brought over from France, Le Notre, the celebrated French landscape gardener, who planted Greenwich and St. James's parks, Carlton and Marlborough gardens. Charles the Second is supposed, by Daines Barrington, to have had the first hot-houses and ice-houses erected in this country, although certain fruits had been long before reared and brought to maturity, by the power of dung-heat, by the London gardeners.

In this reign flourished the celebrated Evelyn, who was a scientific promoter of gardening, and whose *Sylva*, and other works, still remain to adorn the literature of the country. Sir William Temple not only wrote on gardening, but also practised it, to a considerable extent, at his seat at East Sheen, to which place he introduced from the continent some of our best peaches, apricots, cherries, and grapes. He also attended particularly to the training of his trees on the walls, a system of management at that time in its infancy, and deemed by many of the most celebrated horticulturists of the day as an innovation on the order of Nature, and checking the luxuriance of the fruit-tree.

The gardens of Kew then belonged to Sir Henry Capel, where he is said to have had the choicest collection of fruits in England, and that he was better versed in the management of them than any other living horticulturist. Daines Barrington supposes him to have been the first person of our nobility who paid any attention to their gardens, or bestowed any expense in the cultivation of them.

About the beginning of the eighteenth century, horticulture began to assume a new character. The culinary and fruit-gardens were not only assiduously and successfully cultivated, but forcing had been tried to a considerable extent. In 1719, pine-apples were successfully cultivated at Richmond, by Mathew Decker, and afterwards by Blackburn, in Lancashire. The vine was cultivated at Rotherhithe, by Warner, who is said to have raised from seed the species still called Warner's Black Hamburg. The first instance we have on record of the successful forcing of the vine, took place at Belvoir Castle in 1705.

Many good practical and scientific gardeners lived about this time: Miller, curator of Chelsea Botanical Garden, and author of the well-known dictionary; Lawrance, Bradley, and Switzer; and, towards the middle of the century, lived Hill, Abercrombie, Marshall, M'Phail, and many others. In the early part of that century, Justice and Reid wrote on gardening in Scotland, although the science had before their time acquired a considerable degree of perfection in that country. The gardens of Justice, and those of the Baron Moncrieff, at Moredau, where Ryle practised as his gardener, and published his treatise on peaches and vines, were, at the beginning of the eighteenth century, supposed to be the highest cultivated and the richest stocked in the whole country. Gardening in Scotland has long been attended to, and a degree of perfection attained which is not to be met with in any part of Europe, taking into consideration all the circumstances of climate, and other physical disabilities. The extraordinary strides that horticulture has made towards perfection in the present century, are truly astonishing; and every day some fresh discovery is announced, which tends to remove a prevailing evil, or which facilitates the operations of the practical gardener.

THE
PRACTICAL GARDENER

AND

MODERN HORTICULTURIST.

CHAP. I.

FORMATION OF THE CULINARY

OR

KITCHEN-GARDEN.

THE production and cultivation of those vegetables, which contribute in a very essential degree to the support of man, have a prior claim on our consideration and attention. Every day, the produce of the garden is spread on the tables of the gay, the grave, the rich, and the poor. From the prince to the humble cottager, a garden is an object to which a certain degree of importance is attached, and each endeavours to give it the highest possible cultivation, in order to supply his various wants and desires. In a political point of view, the culinary garden must be considered of great importance to the public; for which reason, we find the grounds surrounding all great cities and considerable towns appropriated to the culture of it. In the environs of London for a considerable extent, little else occupies the ground but gardens, the produce of which finds a ready sale in the different markets of the metropolis. Gardens are not only important as affording the most wholesome food to the inhabitants, but also on account of the employment they afford to hundreds of industrious people, who otherwise would become a burthen on their parish. In this light, abstractedly, they must be considered as a national good. Neither is the cultivation of them less under-

stood, nor the benefits arising from them less appreciated, in the neighbourhood of our manufacturing towns, where the confined and sedentary life of the inhabitants requires food of a lighter nature, and of more easy digestion, than is required by those, who are employed in the more active and laborious professions of life. With the conviction, therefore, that the cultivation of vegetables is of so much importance to society, "we should use all diligence in the proper cultivation of the soil, well knowing that the more we do to it, the more will it return to us its fruits in abundance."

The first and chief object towards obtaining a good garden is to be particular in the choice of a favorable situation; for, if this be not attended to, all hope of luxuriant crops must be abandoned. The second is to make choice of a good soil. Sometimes both of these grand objects are to be met with naturally in the same place, and often both of them have to be assisted, or the deficiencies supplied by art. But wherever a situation naturally presents itself, that is sheltered from cutting winds and well exposed to the influence of the sun, and the elevation sufficiently great to be above the ill effects of damp vapours, and yet at the same time not too high nor too cold, and the soil good, many sacrifices should be made for its adoption. Natural situations are generally much better than artificial ones, and always more agreeable to the economist.

Much has been said, and not without great justice, regarding the choice of a situation; and as it is of the last importance, both for the growth and flavour of all culinary productions as well as for the general features of the other parts of a residence, we will make it the first subject of our disquisition. In all places, where circumstances will permit, the kitchen-garden should be placed at such a distance from the mansion as to be concealed from the view, particularly from the principal windows; but although it is here recommended to be hidden from the house, it does not thence follow, that it should be cooped up in an obscure corner of the park or plantations, neither should it be, as it were, engrafted on the farm-buildings, which is too often the case in very considerable places in this country. The distance which it should be from the house must necessarily depend on a variety of circumstances,

of which the taste of the owner and the size of the place should be first consulted. In a princely residence, the culinary gardens may be at the distance of a quarter, or a half, or even a mile from the mansion, and approached either by a carriage-drive, or by circuitous gravel or grass-walks, according to the difference of the situation. The space between the garden and residence should, if circumstances will admit of it, be occupied first with the lawn around the house of a size and style corresponding to the magnitude and architecture of the building; to this the flower-garden should adjoin, which it is desirable should always be near the house; and next in order, should follow the shrubbery or arboretum; the kitchen-garden and orchard terminating the whole. An arrangement of this sort, so varied as to suit the circumstances of the place, will generally be found to have a good effect, and the combination of the whole in one piece will add much to the convenience both of the proprietor and the person, who has the general charge of the grounds. Even in small places, this arrangement (or probably an improvement on it) may be easily effected; the scale being smaller, the parts may be better proportioned, and, by the assistance of a little art, five or six acres, or even much less, may be so arranged as to give the appearance of grounds occupying ten times that extent.

The culinary and fruit gardens, being at a considerable distance from the mansion, present the owner with an opportunity of displaying his taste and fortune in the disposal of his grounds. If they be well arranged and respectably kept up, they will be an attractive object, and be, as it were, a reason for conducting the stranger through a labyrinth of pleasure-ground. From the kitchen and fruit-garden, the walks may be carried on to the park, the lake, the village, or, if the proprietor be a sportsman or agriculturist, to the kennels or farm.

SITUATION AS REGARDS SHELTER.

A certain degree of shelter is of the utmost importance to the growth of the productions of the kitchen-garden, yet not so as to be shaded by lofty trees from the full rays of the sun. Shelter is necessary, because it renders the garden warmer, by the concentration of the rays of heat from certain

bodies, particularly from the walls; it is also necessary as a preventive to the bad effects of cold cutting winds. Those points from which the most inclement winds generally blow should be guarded (if not naturally) by trees, and no time should be lost in planting them. In making choice of the sorts of trees, those should be particularly selected which are of rapid growth;

Nor will art, that sovereign arbitress, admit,
Where'er her nod decrees a mass of shade,
Plants of discordant sort, unequal size,
Or ruled by foliation's different law;
Studious with just selection, those to join
That earliest flourish, and that latest fade.

Sometimes the situation is rendered sufficiently sheltered by the natural shape or situation of the ground, but if this be not the case, recourse must be had to the planting of trees, these however must be kept at such a distance from the walls as to guard against the evil of being too much shaded, as well as to prevent the roots of the trees, of which the plantation is formed, from robbing the borders, which may surround the walls. The winds principally to be guarded against are the north, the north-east, and north-west, for it is from those points that our coldest winds proceed. In the formation of a new garden, the artist has it probably in his power to adopt a situation already sheltered, and, if other circumstances be favorable, the chance of this situation is not to be lost sight of; for if the garden has to be sheltered by plantations made after it is finished, a certain loss will be sustained. In the event of having the plantations to make, it will be an object to get them up with all possible despatch; the ground, therefore, should be well trenched, and planted with sycamore, poplar, larch, spruce, and balm of Gilead firs, which are our fastest growing trees, and therefore should have the preference; taking care, at the same time, to intermix a sufficient number of oak, beech, elm, and chestnut, to remain after some of the others have been thinned out or have attained too great a height. It is a rule that there should never be any trees of any height on the south side of a garden for a very considerable distance, for, during winter and early in the spring, they fling their

lengthened shadows into the garden at a time when every sun-beam is valuable; on the east, also, they should be sufficiently removed, to admit the early morning rays. The advantage of these precautions is conspicuous in the early spring months, when hoar-frost often rests on the tender buds and flowers, which if it be gradually dissolved, no harm ensues, but if the blossom be all at once exposed to the powerful rays of the advancing sun, when he overtops the trees, the sudden transition from cold to heat often proves destructive. On the west, and particularly on the north, trees may approach nearer; perhaps within less than a hundred feet, and be more crowded, as it is from those points that the coldest and most violent winds assail us.

All the plantations round a garden, intended either for shelter or for blinds, should be composed of evergreens, thickly planted, preferring those which have been reared from seed to those, which have been propagated either by cuttings or layers, as being more likely to assume the habit of trees; as they grow up, clear away the deciduous trees from them, this will afford a shelter in winter and spring, when it is most wanted, and which will not be so well effected, if deciduous trees alone be planted. It must be further observed, that if only a sufficient number of deciduous trees be left, the whole will in time have a good effect.

SITUATION AS REGARDS ALTITUDE.

Under this head it must be remarked, that the situation should not be too high nor yet too low; if too high, it exposes the crops too much to the cutting winds; if too low, it is seldom sufficiently dry at bottom, and there is a natural sourness in low situations which is not easily eradicated by draining or by any other means. Low situations are objected to by Dr. Darwin in his *Phytologiæ*: "The great warmth of low situations," he says, "and their being generally better sheltered from the cold north-east winds, and the boisterous south-west winds, are agreeable circumstances, as the north-east winds in this climate are the freezing winds, and the south-west ones, being the most violent, are liable much to injure standard fruit-trees in summer, by dashing their branches against each

other and thereby bruising or beating off their fruit; but in low situations, the fogs, in vernal evenings, by moistening the young shoots of trees and their early flowers, render them much more liable to the injuries of the frosty nights which succeed them, and which they escape in higher situations." Professor Bradley gives a decisive fact in support of this principle. A friend of his had two gardens, one not many feet above the other, but so different, that the lower garden appeared flooded with the evening mists, when none appeared in the upper; and, in a letter to Professor Bradley, he complains that his lower garden is much injured by the vernal frosts, while his upper one remained uninjured.

SITUATION AS REGARDS ASPECT.

A good aspect for a garden is allowed to be that, which has a gentle declivity towards the south, and inclining rather towards the east, in order that it may receive the benefit of the morning sun; but this inclination should be as slight as possible, or else it will give the garden an awkward appearance. The inclination, however, may be only towards the south, and that not exceeding one foot in twenty, if artificially made, but if the ground have naturally a greater or a less inclination, provided that it be not inconveniently steep, there can be little reason for altering it; ground, which has a considerable slope towards the south is always the warmest; a flat or level surface is not desirable, it will be cold and present a heavy and dull appearance.

A north aspect is to be avoided for general purposes, it being always cold and late. It must, however, be admitted that such an aspect has its advantages in summer, by retarding many crops which otherwise would be brought to seed before they had acquired a sufficient size for the kitchen. Salads, spinach, and cauliflower, are brought to perfection in northern aspects, when they would make little progress, if exposed to the full powers of the sun. In such situations, peas, and many other vegetables, yield superior crops during the hot summer months, particularly in dry seasons. In large gardens it would, therefore, be advisable to have a piece of ground enclosed for those particular purposes, as the pro-

longation of the season of most vegetables and small fruits is very desirable; the size of such a piece of ground might be in the proportion of one-fifth or one-sixth of the size of the whole garden.

Gardens of great fertility and earliness are often to be met with on the sides or near the bottom of hills, particularly if sheltered from the colder points by lofty rocks, the reflection or concentration of the rays of heat from them rendering the situation peculiarly adapted for bringing crops of the most delicate kinds to perfection at an early season. Situations of this kind are not only desirable on account of these advantages, but they are generally very romantic and picturesque, or they may be rendered so by a judicious mode of decoration.

SITUATION AS REGARDS SOILS.

Having expatiated on the necessity and advantage of shelter, our next object, and one not less important, is a good soil. Where the soil is naturally good, it is generally much better, for the majority of purposes, than any that can be made by artificial means, and ultimately must prove a great saving of expense. The soil, if not very bad, is more easily and readily improved, or even entirely made to suit the dispositions of the various crops to be reared, than it is to provide sufficient shelter by artificial means, and is sooner accomplished even on a large and extensive scale. Of whatever description the soil may be, it is absolutely necessary that it should be completely drained, as the basis on which all the future improvement of it is to be effected. If wet, strong, and clayey, draining is of still greater importance; if light, and even dry and sandy, drains should also be introduced at the first formation of the garden, as this operation cannot be either so effectually nor yet so conveniently done at any subsequent period. In the first instance, it is necessary to drain well to carry off the stagnant water, with which the sub-soil may be overcharged; and in the second, to provide against a superfluity of water from heavy rains or other causes. The drains should be so contrived that they may be brought to discharge their contents in larger channels under the walks, and these again should discharge themselves beyond the garden boundary.

All gardeners agree that the soil best calculated for general garden purposes should be of rather a light, rich, friable, loamy texture, dry, mellow, and capable of being wrought at all seasons, and of a good depth, that is, from two feet to three feet and a half; and that the worst kinds are those of the very light sandy, and stiff clayey texture. A loam of a middling texture, rather inclining to sand, will be found the most suitable for the majority of kitchen vegetables; the greater part of which seem to delight in those soils, which are the easiest wrought at most seasons of the year; there are some soils, that have the faculty of producing more early than others, and they are such as are commonly called black sands, in which is found an equal temper between dry and moist, accompanied with a good exposure, and with an almost inexhaustible fertility, rendering them easy to be dug by the spade, and to be penetrated by the rain waters; neither are they so apt to crack in severe droughts like strong clayey soils, nor be parched with heat like sandy ones, nor in hard frosts are the roots of plants and seeds so apt to be thrown out of them as in some others. If the soil be too strong, the roots of plants push weakly into it, and are apt to canker and perish; if too light, and at the same time poor, the roots of vegetables will wander far in search of nourishment, and be unable to collect a sufficient quantity for their support and maintenance. To attain perfection on this head, our aim should be to make choice of a proper natural soil at first, or to compose an artificial one as near as possible to that above described. It is a false principle to depend upon manures entirely, for were they to be had in the greatest abundance, a too free application of them would have effects highly injurious to the quality of vegetables in general. In the formation of a garden, a moderate and prudent expense should be bestowed at the beginning, if the undertaking is to be ultimately crowned with success and satisfaction. It would be desirable to have a variety of soils in every garden, but this is seldom to be met with naturally, and few are at the expense of constructing them artificially, as most of the vegetables cultivated in our gardens seem to accommodate themselves to the soil of which they are formed.

SIZE AND EXTENT OF THE CULINARY GARDEN.

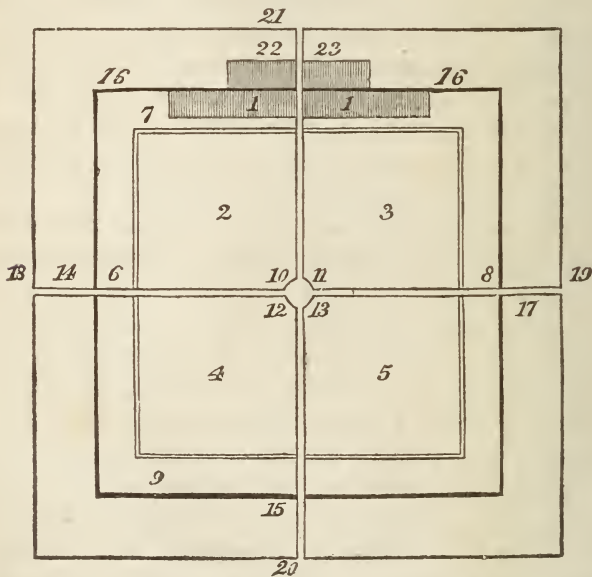
The size or extent of garden-ground, like that of its distance from the mansion, must in some measure depend on the taste of the owner, his style of living, number of his family, &c. It is, however, always better to have too much, rather than too little space, for there is nothing preposterous in a small house having a large garden. Marshall, in his Introduction to Gardening, observes, "some families use few, others many vegetables, and it makes a great difference whether the owner be curious to have a long season of the same production, or is content to have a supply only at the more common times. But to give some rules for the quantity of ground to be laid out, a family of four persons (exclusive of servants) should have a rood of good-working open ground, and so in proportion." This, however, is only applicable to families of retired trades-people, and gentlemen of small fortune, who are not supposed to indulge in all the luxuries of the table, like families of rank and fashion. Few country-seats have less than one acre, and some exceed twelve, in constant and regular cultivation; as kitchen-garden from one acre and a half to five or six acres may be considered as the common quantity enclosed by walls, and the latter size, if properly managed, will be found to afford sufficient vegetables for a family of the first class; as many vegetables, such as potatos, turnips, carrots, and some others, are found to be much better in quality when cultivated in the open fields; if the owner be attached to agriculture, or farms a piece of ground, it will be found very beneficial to grow a supply of those vegetables in the fields. The vegetables thus produced, will be found to be of a higher flavor than those which are reared in the garden by force of manure, and will present an opportunity of renewing the quarters of the garden by fallowing, or giving them rest, in succession. Many gardens are to be met with of greater extent, but it is to be questioned whether, under better management, much less ground would not answer every demand of the kitchen. Nothing can have a more unsightly appearance than a large garden not half cropped, and which is not kept in a neat and respectable order; nor does any thing give a garden

more the appearance of neglect, than to see a part of it converted into a nursery for rearing forest-trees; it would be far better, where the ground is not wanted for a time, to lay a part down in grass, which will tend to renovate the soil, and leave it in a condition to be cropped to advantage when necessary, whereas the rearing of forest-trees exhausts the ground, and leaves it after a time so impoverished, as to be unfit for the production of its proper crops.

FORM AND ARRANGEMENT.

Various forms have been recommended by practical men, particularly for that part of the culinary garden which is surrounded by walls. Some have recommended a square figure. (*Fig. 1.*)

Fig. 1.



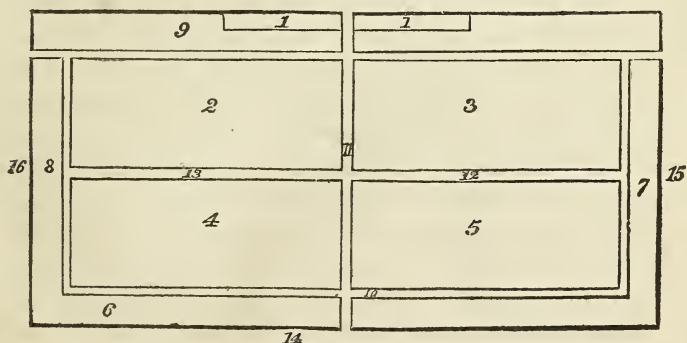
1. 1. *Hot-houses.* 2. 3. 4. 5. *Quarters.* 6. 7. 8. 9. *Borders.* 10. 11. 12. 13. *Walks.*
14. 15. 16. 17. *Walls.* 18. 19. 20. 21. *Outer Boundary.* 22. 23. *Back Sheds.*

Abercrombie recommended an oblong, with the angles cut off, to give a greater portion of the walls behind an equal degree of aspect with those on the garden side. Hitt recommended a geometrical square or rhomboid, so placed that each wall might derive as much benefit from the sun as possible.

M'Phail recommended a square or oblong figure, as the most convenient; and Nicol designed many excellent gardens, formed of squares or parallelograms, with circular projections on the north side. Irregular figures cannot be objected to, as they generally afford a great variety of aspects, and may be justified, if their form be in keeping with the natural surface of the ground, independently of which they are more easily concealed from the other parts of the domain, and even if they be seen, they have not so stiff and formal an appearance as a geometrical figure. They are, however, liable to many objections; if on a small scale, the internal subdivision of them into quarters always ends in too many acute angles, and renders the cropping of them more troublesome. Upon a great scale, however, a considerable degree of taste may be displayed in their internal subdivision, and, if well managed, may be productive of a good effect. The surrounding boundaries of plantation may be rendered much more picturesque, and can be made to harmonize better with the other grounds, than those that shelter more formal figures. Oval and circular figures are liable to the same objection, of being more troublesome to crop.

The form most generally adopted, and by far the most rational, is that of a lengthened square or parallelogram, whose greatest length runs from east to west. (*Fig. 2.*)

Fig. 2.



1. 1. Hot-houses. 2. 3. 4. 5. Quarters. 6. 7. 8. 9. Borders. 10. 11. 12. 13. Walks.
14. 15. 16. Walls.

Such a figure is more conveniently divided into quarters, and those quarters will always present a neat and compact appearance. A form of this shape will produce the greatest extent of south wall, which is a matter of no trivial importance, for, without the aid of those southern walls, few of the finer fruits will arrive at perfection, even in our most favorable situations. The outer fence or boundary need not be exactly parallel to the walls, as circumstances may so combine as to render that disposition unnecessary. The slips or surrounding piece of ground may be cropped with coarse vegetables, and probably planted with fruit-trees and bushes, or, in many cases, be entirely occupied as an orchard; the form, therefore, of the outer boundary need not be confined to any particular figure. A square, like an entirely level surface, will always have a stiff and heavy appearance; but this objection may, in a great degree, be remedied, by running a wall across from east to west, and thus dividing the space into two equal, or unequal pieces. This plan is often adopted, to increase the extent of walls for the production of our finer fruits.

The arrangement of such a figure is simply to carry walks parallel to the walls round the interior of the garden, leaving borders for the cultivation of fruit-trees of sufficient breadth, and bearing a just proportion to the height of the walls. The breadth of these borders is generally allowed to be equal to the height of the walls, for, if narrower, they do not admit of sufficient scope for the roots of the trees to run in, and it gives the walls the appearance of being higher than what they really are. If much broader, they diminish the effect of the walls; and where they are not cropped with vegetables, from an idea that they injure the fruit-trees, a great loss of ground must be the inevitable consequence. A walk should divide the whole garden into two equal pieces from north to south, unless the extent exceed an acre, in which case, two or more walks will be necessary, as also one from east to west, intersecting each other in the centre of the space, and thus dividing the whole into four equal quarters, the sides of each quarter being exactly parallel to the walls. If the extent be more than one acre, it will be advisable to divide it into six compartments, for the greater facility of cropping the whole. In

the arrangement of other figures, it is necessary, likewise, to have the fruit-tree borders divided from the rest by a walk running parallel with the walls, and the remaining space divided in the most equal manner possible. The walks should be separated from the larger compartments or quarters by a marginal border, from four to six feet wide, in which an espalier rail is often fixed, for the purpose of training apple and pear trees, at the distance of three to five feet from the walk; or, instead of espaliers, dwarf standard trees may be planted, according to the taste of the owner. An alley or path, commonly two feet broad, separates this border from the quarters, and is to be used by the labourers while engaged in the several operations of gardening.

WALKS.

Marshall observes, in his Introduction, "that the number and breadth of walks must, in a great measure, be regulated by the quantity of allotted ground, exceeding in those particulars, where there is room; but that few and wide walks are preferable to many contracted ones. If the garden be small, one good walk all round is sufficient; and, if long and narrow, the cross ones should not be many; six or eight-foot walks are not too wide for a moderate-sized garden." In the formation of the walks, the ground, if good, should be excavated to the depth of two or three feet, and disposed upon the compartments, in order to admit of a sufficient depth for a layer of stones, brick-bats, rubbish, or rough gravel, &c., to render the whole perfectly dry at all seasons, as well as to prevent the rising up of the worms. Under the walks, as has been already noticed, good drains should be formed to carry off all superfluous water. The bottom being thus prepared, the lower stratum being laid as hollow as possible, the whole should be finished with the best gravel that can be procured, from six to twelve inches in depth: that of a binding nature is the best. The colour should be of a yellowish hue, as dark coloured gravel, although it may be equally good for rendering a walk dry, firm, and hard, has not so cheerful an appearance; lighter coloured gravels are also sooner tarnished, and

unless exceedingly well kept, soon look ill. Few places are so well supplied with excellent gravel as the neighbourhood of London; that from Kensington is supposed the best, and there are frequent instances of its being exported to Scotland for garden-walks. The advantage of good gravel, for the embellishment of a garden, is of much importance, but there are many situations, where this article is not to be procured, unless at an enormous expense. Recourse, therefore, must be had to substitutes, and there are several, which will make excellent walks, equally comfortable and agreeable as gravel, but which fall far short of it in point of beauty.

Of these substitutes, coal ashes are the best, and for kitchen-garden walks may answer the desired purpose. In those situations, where utility and comfort are the only objects, ashes, when sifted and laid upon any bottom, whether prepared or not, by being rendered dry, make excellent walks; they are not much affected by rain, neither are they apt to be disturbed by frosts, nor subject to be overgrown with weeds; but should the latter be the case, they are easily cleared of them.

Road-sand is also a good substitute for gravel, and that which is procured from roads formed of flints is the best. The walks may be rendered dry before it is put on, in the same manner as gravel, which will prevent the effects of worm casts, to which walks of sand are very subject. It should be laid on in a wet state approaching to mortar, and, when partially dry, rolled down. Walks of this sort are easily kept clear of weeds, and during summer, are neat and clean. In autumn, and during the frosts and thaws of winter, they become soft and unpleasant, and are apt to get overgrown with various species of mosses and conferva.

Saw-dust makes a dry walk, where it can be had in abundance: it is dry and clean, few weeds will make their appearance in such walks, but it is a material which requires often to be renewed.

In Holland, where gravel is very scarce, many of the best gardens have their walks formed of bog-mould; but it is liable to many defects, and is neither dry nor clean.

Small pebbles, imbedded in strong clay, when placed closely together like a causeway, make an excellent, dry and clean

walk, and present a neat appearance; but this, if well done, becomes expensive, and cannot be carried to a great extent with a due regard to economy.

Whether gravel or any of these substitutes be used, it is necessary to have an edging of some sort or another; that of box is certainly to be preferred, as being the neatest and requiring the least trouble in the management of it. Thrift, (*Statice armeria*,) is often used, and will last for a couple of years, but it requires to be replanted so often, that it cannot be recommended. Various other sorts of edging, such as bricks placed on edge, slates, deal, &c., are used, but are all objectionable. Grass edgings are sometimes laid, but they require to be often mowed, and at best have an unseemly appearance.

In gardens of small extent, edgings are sometimes formed of useful kinds of vegetables, such as parsley, strawberries, thyme, hyssop, winter savory, or chamomile; these, while they remain young and ungathered, have an effect not out of character with the kitchen-garden. There are some persons who dispense with all sorts of edgings, and merely defend the edges of the walks with a beaten border, which they renew as occasion may require.

WALLS.

Walls are constructed of various materials, such as brick, stone, wood, mud, or flints. The chief use of walls is for the production of fruits, which will not arrive at an equal degree of perfection on espaliers or standard-trees. They are also of use to surround the kitchen-garden, for the better exclusion of hares and rabbits, which cannot be kept out by any other fence. They also afford a considerable degree of shelter, and, by the reflection of the rays of heat on the borders, render them better calculated for the production of tender vegetables at a season earlier than they would be produced in the open quarters of the garden.

Many good kitchen-gardens, however, considered merely as such, are wholly destitute of walls. Fences of various materials and constructions have been used in former times, and

instances occur, in our own day, of very good gardens being enclosed by hedges, paling, and other sorts of fences.

The late Walter Nicol, who had a much greater experience in the formation of gardens, than any other practical author on the subject, gives the following directions on this head: "In designing and laying out a modern garden, a degree of taste, as well as fitness or propriety, ought to be displayed, the basis of which is the right placing, proportioning, and constructing of the walls. If these be properly set down, so as to answer the cast of the ground, and be raised to proper heights according to its extent, the rest is easy, and follows as a matter of course."

"In this particular branch of gardening, utility and simplicity ought to go hand in hand, otherwise a display of genuine taste will be wanting. It is not in curves, circles, nor ogees, that, in this instance, we derive any satisfaction. The direction of the walls, if the ground will admit of it, should always be in a direct line. They may be built perpendicularly, or they may be inclined so as to suit the general cast of the ground; but the nearer they approach the perpendicular, the greater pleasure will they afford. The eye is distracted, and the mind is impressed with fear, in beholding any building apparently insecure. We can look on a mast placed obliquely, or a tree glowing aslant, with firmness and satisfaction, because we know the one is supported by ropes, and the other by roots, but we look with a degree of distrust and of fear on a wall running much off the perpendicular."

After stating the necessary choice of the ground as regards situation and shelter, which we have already treated on, Mr. Nicol proceeds to recommend, that if "the north wall can be placed quite level, and also the south wall, on a lower level, and so, as that the east and west walls shall fall from north to south a foot in thirty, or in twenty-five, or according to the slope of the ground; and if the ground be lengthened from east to west, in the proportion of three to two, the extent being two or three acres, on such a spot may be erected a garden that will not fail to please."

If the surface of the ground be of an unequal height, the walls should be so also, and probably the best rule that can be

laid down, is to build the walls in such a manner that their coping may be parallel to the ground surface, provided that it be not very much distorted; in that case, it will always be better to regulate the surface to a somewhat regular shape.

Where the ground is a dead level, it will be necessary to have the walls of different heights to give relief, otherwise the whole will have a heavy and dead appearance. The height of the walls should be regulated according to the size of the ground inclosed, as well as to the sorts of trees intended to be placed against them. In small gardens, the walls should be rather low than otherwise, for a small garden surrounded by high walls has a gloomy and heavy appearance; this objection, however, may be obviated, by having them of different heights, always making the north wall the highest, and the south the lowest. The principal walls of gardens of any considerable extent are seldom below ten feet, and seldom exceed sixteen. For gardens of ordinary dimensions, we should consider from ten to twelve feet to be a good height, thus making the north wall twelve, and the south one ten. However, the height of the north wall must be in general regulated by the height and width of the hot-houses, which may be placed against it; and under such circumstances, if the height be more than twelve feet, the effect will not be unpleasant, as the houses will bear a proper proportion to it. Hot-houses are required of different heights, in order to suit the purposes for which they may be intended; and this necessary inequality of height will tend to relieve the height of the walls; and still farther to accomplish that end, it would be advisable to have the highest part of the wall in the middle, and the breaks gradually declining to each end. "In a garden of an acre, being a parallelogram of the best proportion, and of a gentle declivity," Nicol observes, "the north wall may be raised to the height of fourteen feet, the east and west walls to twelve, and the south wall to ten, above the ground level. If the ground slope considerably, the breakings in the respective heights of the walls may be less; they may be only a foot, and the relief will be the same, or nearly the same, to the eye, in ranging along their surfaces. In gardens of greater extent, the walls may be raised to a greater height, but by no

means in proportion, if it extend to several acres. The extreme height of the north wall, in any garden, should not exceed eighteen feet; and on the supposition that it contains four acres, the east and west walls should be fifteen, and the south wall only twelve feet high, in order that it may give the necessary relief to the eye. In a garden four hundred feet long, and three hundred feet broad, which forms a handsome parallelogram, and contains something above two English acres, if the ground lie on an easy slope, a very eligible height for the north wall is sixteen feet, for the east and west walls fourteen, and for the south wall twelve. But if the ground be quite level, or nearly so, the north wall being the same height, the east and west walls should be thirteen and a half feet, and the south wall eleven feet in height, or the east and west walls may be only thirteen, and the south wall ten feet high, if it be a dead level."

Many persons are, however, content with walls of more humble dimensions, and where the production of fruit only is the consideration, no doubt can exist, but that lower walls answer the purpose equally well, and in all cases will produce an equal, if not a greater, quantity of fruit, in proportion to their respective surfaces. Where economy is a consideration, low walls, of six or eight feet in height, are to be preferred to those which are from ten to eighteen. The generality of trees will thrive well on such walls, and some kinds are supposed to flourish better. The peach-growers on the continent prefer low walls; and that practice has been, in some cases, adopted in this country with complete success.

Walls are generally built perpendicularly, or nearly so, and are found to answer the purposes for which they are intended, provided that the operative department be well managed; we cannot, therefore, divine what benefit is to be gained by deviating from this practice; although several authors have recommended sloping walls, that is, building them so as to present an inclined surface to the horizon, from an idea that the sun acts with more vigor upon such walls than upon perpendicular ones.

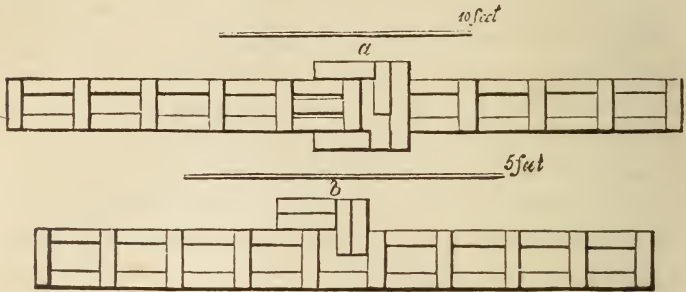
A great variety of walls has been offered to the public, and highly rated by the inventors, as a matter of course. In these

pretended improvements, we see not the least possible advantage over perpendicular and straight walls; on the contrary, we observe many disadvantages attending them, particularly in the expense of their construction, and in their total want of beauty. Amongst these are the waving or serpentine wall, the angular wall, the zig-zag wall, the square fret wall, the pier'd wall, and walls with arched niches or recesses, all of which are inferior in beauty and utility to the straight wall in common use.

Hollow walls have been recommended, as possessing the same strength, without the same number of bricks being used in the construction of them; this is in itself important, and such walls are capable of being heated by artificial means, as the occasion may require, for the purpose of ripening late fruit, but more especially for ripening the young shoots, which is still more important, and is, in fact, the principal use of hollow or flued walls, and, when fuel is moderate in expense, is found to be extremely useful. But the success in this case, as in many others, depends upon the judgement and assiduity of the gardener.

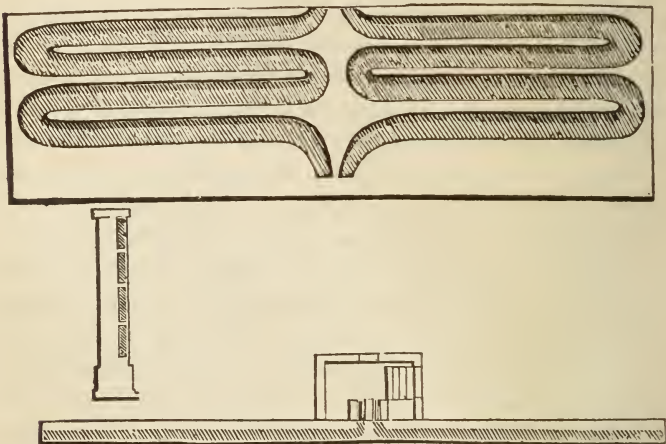
The cellular wall is a recent invention, the essential part of the construction of which is, that the wall is built hollow, or at least with communicating vacuities, equally distributed from the surface of the ground to the coping. If the height do not exceed 10 or 12 feet, these walls may be formed of bricks set on edge, each course or layer consisting of an alternate series of two bricks set edgeways, and one set across, forming a thickness of nine inches, and a series of cells, nine inches in the length of the wall, by three inches broad. The second course being laid in the same way, but the bricks alternating or breaking joint with the first. The advantages of this wall are obviously considerable in the saving of material, and in the simple and efficacious mode of heating; but the bricks and mortar must be of the best quality. This wall has been tried in several places near Chichester, and at Twickenham, by F. G. Carmichael, and found to succeed perfectly as a hot-wall, and at 10 feet high to be sufficiently strong as a common garden-wall, with a saving of one brick in three. As a whole, indeed, it is stronger than a solid nine-inch wall, on the same principle that a hollow tube is less flexible than a solid one.

It is evident, that the same general plan might be adopted in forming cellular walls of greater height, by increasing their width. A very high wall might have two systems of cells divided vertically, one or both of which might be heated at pleasure. Piers may be formed either on both sides of the wall (*a*), or on one side by bricks on edge (*b*), so as to bond in with the rest of the work.



A great advantage may be derived from walls built so as to be heated as the occasion may require; these are denominated hot walls, and have hitherto been constructed by introducing a system of common smoke-flues (as *fig. 1*) distributed through

Fig. 1.



the wall at certain distances. These flues are objectional, merely as they require frequently to be swept, which is not

very readily effected; independently of which, they are, like all flues heated by hot air or smoke, liable to become cool soon after the fire ceases to burn. An improvement has been designed by W. Atkinson, Esq., of Grove End, and for its utility and simplicity deserves to be in more general use; it consists in building the walls hollow, which will be found far more economical and equally strong, and introducing, within a few inches of the bottom of such cavity, hot-water pipes, supplied from boilers, which may be built in the wall, and the fire fed and managed from behind, such boilers being placed at the distance of from fifty to one hundred feet apart; or one boiler, placed in the middle, will heat one hundred feet or more of wall sufficiently, by having the pipes branching both from the right and left, a space much greater than could by any other means be heated by one fire. These pipes require no cleaning nor repair, if once properly placed, and can be erected at a very moderate expense; they possess a decided advantage over hot air or smoke flues, by continuing to give out heat to the wall long after the fire has ceased to burn, and this property will increase according to the size of the pipes that may be introduced. For the side walls, which have an eastern and western aspect, the pipes may be placed in the centre of the walls, so that both sides may derive an equal degree of heat from them, as *fig. 2*; and for walls having only a southern aspect, the walls being thicker, the pipes may be so arranged as to have only one brick of thickness in front, and the remainder of the thickness on that side where the heat is not required (*fig. 3*). The water being heated in the boiler will flow along one pipe to its extreme point, say one hundred feet, and there make a turn by an elbow joint, and

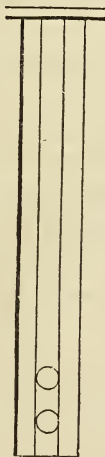


Fig. 2.

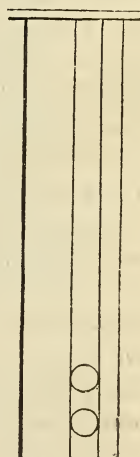


Fig. 3.

return to the boiler by a pipe immediately below it, which will enter the boiler near its bottom. The water in this lower pipe will travel with more rapidity by forming an inclined plane from the extremity to the boiler; the top pipe may be perfectly level. Thus the water will continue to circulate in the pipes long after the fire is extinguished, or, indeed, as long as any heat remains in the boiler or brick work round it. It has been ascertained that water heated by this means will travel at the rate of forty feet per minute, with an ordinary fire, but this rate may be much increased. The distribution of heat by this mode is so equal, that the pipes will be found as warm fifty or sixty feet from the boiler, as they are where they are connected to it. This is never the case with smoke flues; from which arises the many complaints that hot walls are burnt up in one part, and little affected by the heat in others. (For a more full account of this mode of heating, see the FORCING GARDEN).

Sunk walls, or such as are built under the general surface of the ground, or nearly so, and are known by the names of *haha's*, or sunk fences, have not been often adopted for general purposes. Instances occur, however, of the adoption of these walls, where it has become necessary to conceal them from the sight. These walls have many advantages, and might be much more generally adopted than they are; they, however, possess this disadvantage, that they present only one surface for the purpose of planting trees against; but, to balance this defect, they are much stronger, are not liable to be blown down, and from the rays of heat being reflected from them to the opposite bank, and again reflected upon the wall, together with their being completely sheltered from cutting winds, renders them extremely well calculated for the production of early fruits; in addition to which, a garden enclosed with sunken walls may be rendered more picturesque than one with lofty walls, which, in confined places, are often difficult to hide. In our practice, we once had a sufficient proof of their superiority as regards the production of early crops. In the management of such walls, the trees may either be planted in the bank and bent into the wall, or, in many cases, they may, with greater propriety, be planted behind and trained downward. The ex-

pense of constructing such walls will not be so great as might at first sight be imagined; the ground need not be excavated to more than the depth of half the height of the wall, the soil removed being placed upon the top of the original surface, will give the depth required. In situations naturally damp, such a mode of enclosing a garden will tend materially to render it dry.

Reed-walls and screens are used by Mr. Nieman, gardener at Hylands, near Chelmsford, the seat of P. C. Labouchere, Esq. What is called a reed wall (*fig. 1 & 2,*) may be described as 10 feet high, and consisting of a double trellis, *a b*, composed of horizontal laths about eight inches apart, a coping board nine inches broad; the reeds placed endways within the trellis, *d*, and supported about a foot from the ground to keep them from rotting; the interval of a foot being filled up with slates placed on edge, *e*; the trellis rods are nailed to posts, (*fig. 2, f,*) and, by taking off a few of these rods on one side, the reed-mats can be taken out and renewed. Russian mats would, no doubt, answer well, and last a long time, and they might be taken out with still less trouble. Straw mats would also do, where reeds could not be got; and heath, as being of a dark color and very durable, would make the best of all structures of this kind. Mr. Nieman finds that



Fig. 1

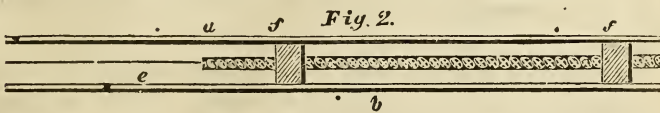


Fig. 2.

peaches, grapes, and other fruits, ripen just as well on these structures as on brick walls.

The trellis against reed walls should consist of horizontal wires, rods, or laths, when vines, currants, or trees, are to be trained vertically; and of vertical wires or rods when trees are to be trained in the fan or in the horizontal manner.

The common brick walls of the garden at Hylands are, for the most part, trellised, Mr. Nieman considering the trees less liable to injury from extreme heat, and the fruit likely to be better flavored, when the branches are kept a few inches from the wall, and the fruit in consequence surrounded by a free circulation of air.

The thickness of walls must depend principally upon their height and situation, whether sufficiently sheltered or not. Few walls exceeding eight or ten feet in height can be sufficiently strong, if less than fourteen inches in thickness, if made of brick; but, if made of stone, they must be rather thicker. It is better to build them of a sufficient thickness, in order to render them secure, than to erect them of a smaller dimension and have recourse to piers to support them; for, notwithstanding the benefit of such supports, they have an unseemly effect, and are very inconvenient for the operation of training. In those cases, where these supports are necessary, it is better to construct them so as to project from the north side of principal walls, on account of their being less exposed to the sight. No objection can exist to such projections, when the doors are cut through the walls, for a greater thickness of wall at such places will give strength to them, and if performed with judgement, the effect rather than being prejudicial may be ornamental. It is of material consequence, that the foundations be good, and that they should be constructed of greater thickness to within a few inches of the ground level, so as to afford a sufficient base for the wall to stand upon; as, from the nature of the ground, and the subsequent operations to be performed on them, they may naturally settle or be disturbed, and in such cases, the consequences might be attended with serious inconvenience.

The materials of which walls are composed are as various as the heights to which they should be carried. Bricks are generally allowed to be the best, forming by far the neatest wall, and from their nature are much warmer than stone, wood, or

clay, independently of which, they possess the advantage over stone walls, as being better calculated for the training of the trees. Some authors have gone so far as to say, that where bricks cannot be procured, it is better to dispense with walls altogether; but against this opinion, we enter our most decided caveat, for many excellent walls are made of stone, mud, and wood, which have been found to produce the most luxuriant crops of fruit. In those places, where bricks are scarce, the walls may be built of stone, and faced with brick, and in such cases, they are as good as those built entirely of brick: walls of this description are often met with in Scotland, and in many parts of England, where stone is abundant. Stone walls, if well built, are more durable than brick ones, particularly those, which are built of stones dressed to regular sizes and laid in courses. Mud walls are used in many places where both bricks and stones are scarce, and for low walls they are found to produce the desired effect; these walls, however, require to be secured by thatch, or broad projecting copings, in order to render them dry, or else the expansion occasioned by frost would soon reduce them to ruin. These copings, although offensive to the eye, are nevertheless of considerable benefit to the trees in the vernal months, while the blossoms are forming, and also during their expansion, by protecting them from the effects of vertical frosts; and their use is also obvious while the fruit is in a state of maturity, by preventing heavy rains from injuring their flavor. In the management of the trees upon such walls, the use of the garden-engine should be freely exercised, as the trees are excluded from the benefit of the dews, and also from a due portion of natural moisture from summer showers. Portable copings are useful in granting that necessary protection, as will be demonstrated in the sequel.

Flint walls, although neither neat nor well calculated for training, are nevertheless often used in chalky countries, and fruits are found to ripen upon them very early. The first wall-fruits brought to Winchester market are from trees planted on the ruins of the old city walls, which are chiefly composed of flints.

Wooden walls have long been in use, but although fruits are produced upon them in the greatest perfection, they are

much less durable than those of brick or stone. In order to render them more permanent, they should be composed of the best timber, particularly the uprights, to which the boarding is fastened, and that part which is let into the ground should be charred, as well as a certain portion above the surface, as at that particular spot they are the most liable to decay. Iron uprights might be substituted, but in their use, an almost insuperable difficulty would present itself in attaching the boarding to them. Wooden walls should be either well covered with some durable paint, or with the composition called *coal-tar*. The latter, however, has a disagreeable smell for a long time after its application; and such walls will always have a sombre and repulsive appearance. The boards of them should be placed in an imbricated manner, and for this purpose they should be cut with a thick edge on one side, and a thin one on the other, such as is technically called weather-boarding. If the boarding be thick, it would be advisable to join them as closely as possible; and, in order to prevent the air passing through the joints, which will open considerably, however well seasoned they may be, nail thin strips of deal to cover each joint. These may be placed on the back of the wall, and will not be so much exposed to view. Wooden walls are expensive, and although they may be useful for nurserymen, for the purpose of training young trees upon, they cannot be recommended as advantageous or elegant in a well-disposed garden.

Garden-walls, however constructed, or of whatever materials they may be made, require as much care in having them well furnished with a coping, as it does to furnish a house with a roof, and also on the same grounds, of keeping them dry and wholesome. All buildings are found to last a greater length of time when properly secured from wet, and as garden-walls are exposed to all the vicissitudes of the weather, it is of importance that they be furnished with a coping sufficient to throw off the rain that may fall upon their upper surface. It has been a question much agitated amongst horticulturists, whether the projection of the copings should be large or small, or whether they should project at all. It is obvious that they should project over the wall sufficiently to throw off the rain: but that they should project considerably, is still a

matter of question. If the coping project over the wall more than from two to three inches, it will give the wall a heavy appearance, and therefore we would recommend that the projection of the fixed or permanent coping should not exceed those dimensions, and they will be found, in every respect, sufficiently large to guard the walls from the effects of wet. Copings of greater breadth are, however, useful at certain seasons, namely, when the buds are breaking, and while the blossom is expanded, as they answer the purpose of guarding them against the effects of perpendicular frosts, which would be highly injurious to them at that critical period. We would recommend portable or moveable copings of boards, supported on brackets of iron, either built into the wall, or driven in afterwards, and these brackets should be perforated with holes, in order to admit of the boards being fastened down to them. The breadth of such copings will vary according to the height of the wall, the low ones not requiring such broad copings as those that are more lofty. If the boards be twelve or fifteen inches broad, they will be found sufficient for the purpose required. As soon as the fruit is fully set, these boards may be removed and stored away in a dry place, where they may remain until wanted the following spring. It is only while the trees are coming into blossom, and while they remain in that state, that these copings are of use; their removal after that time will be advantageous to the trees, by allowing the dews and rains of summer to fall freely upon them. If the trees be kept dry while in bloom, the frost will not act so severely on them, upon the principle that all vegetables resist the effects of frost, in proportion to the dryness in which they are kept.

The permanent or fixed coping is intended for the protection of the walls, and should be so constructed as to insure the accomplishment of that end. For this purpose, nothing is so good as stone pavement, it being found of greater lengths than bricks or tiles, and the greater the length of such pieces, the fewer joints will be necessary, which is in itself important. Their durability is also great, and they present a neater appearance to the eye than those of any other material. In those places, where stone is expensive, bricks should be procured of different descriptions, intended for wall copings, and if laid in

cement, will last a long time, and render the walls perfectly dry. Some persons consider it a matter of consequence to place the coping in such a manner, that it may throw the rain that falls upon its surface to the worst side of the wall, and others construct it on such a principle, that the rain may fall equally on both sides; but to neither of these cases ought much importance be attached, for the whole rain that falls on the surface of a garden-wall is, considering the time which it is in falling, so trifling, that it cannot injure one side much more than the other; for if both surfaces be planted with trees, they will, in the generality of seasons, absorb all the moisture that falls, without any great inconvenience or injury to the fruit. It is certainly an error to throw all the rain-water to the worst side of the wall, as the injurious effects are thereby increased, particularly in northern aspects, which are of themselves naturally damp. In the generality of cases, an equal division of the water may be considered as the most rational. Bricks of various forms have been used for this purpose, and the greater the thickness of them, the greater will be their weight, consequently they will bind the wall better together, and they will be less liable to be displaced. The edges which project over the walls should be made thinner than the other parts, or else they will have a heavy appearance. The annexed figures represent the different forms of bricks often used for this purpose, and may be procured at any brick-kiln, and in most cases, will be cheaper than stone.



WATER.

Water is so necessary an element in the formation of vegetable bodies, that without it they could not exist. It is of the utmost consequence in a garden, and no one should be without a regular supply. The expense which the market-gardeners in the vicinity of London incur, in providing this element alone, is a sufficient proof of its indispensibility; and the crops, which are reared by the liberal use of it, are strongly corroborative of the justness of the remark. In all well-regulated gardens,

water should be supplied in the greatest abundance, and the disposal of it should be so regulated, that it may be conveniently and expeditiously applied to every part. This is an improvement in gardening, which, although long acknowledged, has been apparently little attended to. There is no situation in which water might not be had, and in many, with very little trouble or expense. Mr. John Hay, as a garden architect, has attended more to this important object than any other designer of the present day; and the good effects of his system are exemplified in many gardens laid out by him in different parts of Scotland. The gardens of Lord Roseberry and Viscount Duncan, designed by that artist, are described in the Edinburgh Encyclopedia, art. *Horticulture*, as having water supplied to them from a reservoir, situated on an eminence at a considerable height above the garden walls. Around the whole garden, four inches below the level of the surface of the ground, a groove of between two and three inches in depth has been formed in the walls, to receive a three-quarter inch pipe, for the purpose of conducting the water. Apertures of two feet and a half high, and ten inches wide, and about fifty feet distant from each other, are made in the wall, in which a cock is placed, so that on turning the handle to either side of the wall, the water issues from that side. The nozzles of the cocks have screws on each side, to which a leathern pipe is attached at pleasure, with a brass cock and director; roses, pierced with holes of different sizes, being fitted to the latter. By this contrivance, all the trees, both on the inside and the outside of the wall, can be effectually watered and washed in a very short space of time, and the whole process attended with very little trouble. One man may go over the whole in two hours; at the same time, the borders, and a very considerable part of the compartments, can be watered with the greatest ease, as the occasion may require. The convenience and utility of this plan must, at once, be perceived by every practical horticulturist.

It is almost unnecessary to add, that river, pond, or rain-water, is to be preferred for all purposes of garden culture, to that which is procured from springs or deep wells, unless the water of the latter has been collected into a reservoir freely

exposed to the action of the air, by which means it becomes softened, as it is technically called, and more fit to enter into the parts of vegetable economy. When water abounds upon grounds more elevated than the garden, the advantage should not be lost sight of, as, at a moderate expense, a regular and constant supply of water can be brought, either in pipes of lead or earthenware; or, which is still more economical, where circumstances will allow, in an open drain; and, to use the phrase of an antiquated writer on this subject, this will prove *the life and soul of the garden*.

Reservoirs of considerable magnitude have been formed, not only in gardens, but also in their immediate vicinity, sufficiently capacious to contain all the water, which is collected on the hot-houses, and other buildings, attached to the garden. One of the most complete, as well as the most capacious of this description, has been lately formed by Mr. Forrest, at Sion-House, the Duke of Northumberland's, and is constructed entirely of iron. This is, however, a more expensive mode of building reservoirs than many, from prudential motives, would be inclined to adopt; the convenience, nevertheless, of such a reservoir will be the same, with this simple objection, that as it is some feet below the level of the garden, the expense of pumping it up will be considerable. Reservoirs should, in our opinion, be placed at such a height above the surface of the ground, as to admit of the water being dispersed over the whole of the walls in particular, by means of a portable pipe, as recommended by Hay, and adopted by many other horticulturists. Where circumstances will admit of it, partial irrigation will be found extremely useful in gardens, particularly in the height of summer, and during severe droughts. The serious injury effected by the last three dry seasons is strongly corroborative of the truth of the foregoing remark. Strawberries and raspberries, in particular, amongst the fruits; and celery, cauliflower, and several others, among the vegetables, will be considerably improved by this mode of cultivation.

In those places, where water cannot be procured from elevated grounds, the various modes of digging wells, and boring, which is a late improvement of great value, may be resorted to. In the former case, a pony or donkey could be usefully

employed in driving an engine capable of raising a sufficiency of water for a large garden; and, by the latter mode, it might be brought to flow to the surface in almost any part of the grounds, provided local circumstances will admit of its adoption. An instance of the great advantages of the former plan presents itself at Manor-House, in the New Forest, where water is brought from a great depth for the supply of the establishment; and, in the latter case, they are exemplified in the gardens of the Horticultural Society, at Chiswick, and in many other places. Ponds and basins for water are not always pleasing in gardens, and when on a large scale, are of an injurious effect. The expense of watering from them is great, and cannot be done without considerable damage to the crops. Portable force-pumps might be used in such cases, but, if employed on a large scale, will be attended with considerable labour and expense. Triangular wooden troughs might be usefully employed, and, if taken proper care of, will last many years. They need not be of large dimensions, three or four inches in depth being amply sufficient; and they may be so placed, as to convey the water to any distance on the surface. If made in convenient lengths, they are easily managed, and the length at the farthest extremity should be perforated with holes, for the more gradual division of the water. As this mode of watering is intended for the surface only, a boy might be employed in directing the course and division of the water. These troughs, when not wanted, should be cleaned and laid by in a dry place.

ENTRANCE TO THE KITCHEN OR CULINARY GARDEN.

The entrance to a park, or mansion, is one of the most striking features of a noble residence, and affords the proprietor or designer the most favourable opportunity of displaying his taste, equally with the architect in the structure and elevation of the house. This has been a subject which has occupied the attention of the landscape-gardener for a long period, and some beautiful specimens are to be met with from the designs of Repton and others; yet it is singular, that so little taste has been displayed in the entrances to gardens in general.

First impressions are often the most forcible, and, for want of a little skill and management in this matter, many of our finest gardens are seen to great disadvantage; the principal entrances to which are made at points, where the general beauties are concealed, or seen only in a very limited and imperfect manner. Nothing is more common than to see the principal walk leading from the mansion to the garden, conducted through the most uninteresting part of the grounds, and in general making its entry from behind. "Nothing can be more unsightly than the view of the high north wall of the garden, with its back shades and chimney-pots from behind, or even getting the first *coup d'œil* of the hot-houses from a point nearly in a parallel line with their front. The effect of many excellent gardens is lost, or marred, for want of attention to this point, or from peculiarity of situation." The principal walk which connects the rest of the grounds to the garden, and by which strangers should be brought to see it, requires some taste in its construction, and should always be made as interesting as possible. The points at which a garden should be entered, should be chosen according to local circumstances, so that the eye may rest on the most prominent objects, such as the hot-houses, &c. For this reason, the entrance should be from the south, south-east, or south-west; and, on leaving the garden, no objection can exist to the walks branching from the opposite points.

THE SITUATION OF THE MELON AND CUCUMBER GROUND.

The melon ground is generally denominated that piece of ground occupied by pits, frames, &c., for the cultivation of melons, cucumbers, young pine-apple plants, and such fruits and vegetables that either require artificial heat for their culture, or their early production before their natural season. The melon ground should be chosen in the most warm, dry, sheltered part attached to the garden, as the operations connected with the culture of that fruit, and other vegetables, under frames, are such, as to render it desirable that the melon ground should be placed near the outside of the garden, for the more readily supplying it with dung, mould, &c., which

would be extremely inconvenient if placed within the walls of the garden, independently of the uncleanly effect which it exhibits from the dispersion of the litter, and other unpleasant circumstances inseparably connected with hot-beds. The compost yard, for the preparation of the various sorts of moulds used in the garden, as well as a piece of ground appropriated for rubbish, pea-stakes, fire-wood, &c., should be contiguous to the melon-ground; and, for the appearance of greater neatness and regularity, these places should be divided from each other by walls, or evergreen hedges, which will not only afford shelter, but also conceal all disagreeable and unseemly objects. The site of these grounds should be either behind the garden, or in the slips on the eastern or western sides, preferring those situations, which are exposed to the sun during the short days of winter, and sheltered sufficiently from winds, but not to that extent, as to render them damp or gloomy.

The nearer that the melon-ground is placed to the forcing-houses the better, as the operations in both are intimately connected; and where pits are used, the melon-ground may be rendered a neat appendage to the garden, if kept neat and clear of all superfluous matter; but, where frames and dung-beds are used, the very materials of which they are made, preclude the possibility of absolute neatness; neither is there any particular necessity in the melon-ground for that systematic attention to neatness, which is so indispensable in the other departments of the garden. Were the hot-water system of heating more generally adopted, as applied to the forcing of fruits and vegetables, a very neat melon-ground might be made of well constructed pits, heated only by that means, and at a comparatively less expense than that, which is incurred in ordinary practice. The compost-ground should also be exposed to the full influence of the sun, and be rendered perfectly dry by draining or otherwise. Damp and shaded situations are peculiarly ill-adapted for this purpose, and should be avoided as having a tendency to injure, rather than to improve the various materials brought thither for the purpose of being ameliorated, and fitted for the more delicate fruits and plants.

CHAP. II.

NATURE AND MANAGEMENT OF SOILS.

EXPERIENCE has taught us that different vegetables and fruits require not only different treatment in their various stages of growth, but also that they stand in need of different soils to bring them to any degree of perfection. This has been partially accounted for in the rationale laid down by Sir Humphry Davy on the necessity of a rotation of crops. It is, however, notwithstanding that doctrine, not always necessary that a different soil should be prepared for every different production of the garden, for such a practice would not only be extravagant but absurd. Nature, in her infinite wisdom, has, among other wise ordinations, provided that soils of different natures are, in many cases, to be found in the same acre; and, if possible, they should not be wanting in the same garden. In those cases, where nature has not been thus bountiful, recourse must be had to art.

“The varieties of soil in any garden,” says Nicol, “may be with propriety confined to the following: viz. strong clayey loam and light sandy loam, which are the two grand objects; a composition of one-fourth strong, with three-fourths light, loam; half strong and half light; and one-fourth light and three-fourths strong. These, by a proper treatment, and with the proper application of manures, may be rendered productive of any of the known and commonly cultivated vegetables in the highest degree of perfection.”

Soils may be improved by a variety of operations performed on them, independently of their improvement by manures. This is a serious consideration to all cultivators of the earth, but much more so to the gardener than to the farmer; and for this important reason, that it exonerates his productions from the charge of being either unwholesome or ill tasted, on account of the pabulum, or food from which they derive their support. Thus, vegetables grown in the open fields, where we are to suppose the land less glutted with manures, is by the

majority of people preferred to those, which are grown in highly manured gardens. Hence the necessity is obvious, of improving the soil by other operations than that of yearly gorging it with more manure, than is actually necessary for bringing to perfection such vegetables, as are expected to be produced.

The first and principal effort towards the improvement of soils is to be performed by the operation of pulverization, which is effected by trenching, digging, and ridging; the main object of which is, to give scope for the roots of vegetables to penetrate in every direction to which they may be disposed in search of nourishment, as well as to prevent the free circulation of both air and water from being impeded. The mechanical division of the parts of soils is an improvement, and applicable to every soil according to its adhesive texture. The lightest soil will become, in course of time, if left undisturbed, too compact for the proper admission of air, rain, and heat, as well as for the free growth of the fibrous roots of plants; and, on the other hand, strong lands will, in a much shorter time, become quite impenetrable to the roots of vegetables, the strong taproot of the oak, and some others only excepted. Without an abundance of roots, no vegetable flourishes, therefore we ought to adapt the soil, as much as possible, to the encouragement of those necessary organs, the conviction being strongly impressed on our minds, that the quantity of nourishment which is taken up, depends more on the number of absorbing fibres, than the quantity of nutritious extract contained in the soil. The rendering the soil of a proper consistency, by trenching or digging, is not only necessary before sowing or planting, but also during the progress of vegetation, and this should be performed by digging or hoeing between the rows, or round the stems of plants. A strong proof is here adduced of the superiority of planting or sowing culinary vegetables in drills, as, by that means, the operation of pulverization is better and more conveniently performed. Even digging between the rows of some plants is of much importance to them, as by that means, it operates on the principle of pruning, by cutting off or shortening the extending fibres, which causes them to throw out a number of others, by which the mouths or pores of the plants are considerably increased;

and thus, by multiplying the number of organs, the plants will of course collect a greater quantity of food.

The capillary attraction, or that property, which renders the humidity of the soil more uniform, is also promoted by trenching, digging, &c. It is evident, that those soils must be the driest, where the particles of the soil are either naturally of the finest kind, such as sand, or rendered fine by digging or trenching. We find that gravels and sands, which are naturally reduced to fine particles, hardly retain any water at all, and frequently not even sufficient for the growth of vegetables, which is the cause of their sterility; whereas, on the other hand, clays not acted on by artificial operations, either do not absorb water, or when they do, they retain too much. Water is not only necessary to the growth of plants, but also to the production of extract from the vegetable matter which they contain, and unless the soil be brought to that condition, so as to retain a certain quantity of water, just sufficient and no more to produce this extract, all endeavours to fertilize, by means of manures, will be fruitless.

Manure is of no use to vegetation until it becomes soluble in water, and it would remain in that useless condition if it abounded so as to exclude the air, for without air, the fibres, or mouths of plants, would be unable to perform their functions, and so decay, and rot off. This principle, we see completely exemplified in the roots of plants in pots, when over watered, which gradually decay, and the plant dies.

To admit the beneficial effects of air, as much as possible, is an important object. Dr. Darwin mentions, "the great propriety of cropping lands immediately after they have been cultivated or turned over; and this the more especially, if manure has been added at the same time, as the process of fermentation will go on faster when the soil is loose, and the interstices filled with air, than afterwards, when it becomes compressed by its own gravity, the relaxing influence of rains, and the repletion of the partial vacuums formed by the decomposition of the enclosed air. The advantage of the heat thus obtained, in exciting fermentation, whether in a seed or root, especially in the spring, when the soil is cold, must be considerable."

It is necessary that all soils should be kept open by artificial means, for the purpose of admitting a sufficient quantity of warmth to the roots of plants. All earths are bad conductors, and therefore it would be long before the rays of heat could penetrate to a sufficient depth, particularly in spring, to be of much importance to the roots of vegetables, unless, indeed, the soil is, by frequent turning, rendered capable of admitting a free ingress of the warmth, both of the sun's rays and of tepid rains.

Open soils are also necessary for the effecting of those changes, which all manures have to undergo, before they are in a proper state for food to vegetables. Animal and vegetable substances, when exposed to the action of light, air, and water undergo spontaneous decomposition, which would not otherwise take place, and by that process they are properly prepared for the nourishment of vegetables.

The improvement of soils by pulverization, that is, by the operations of trenching, digging, hoeing, and stirring, we consider to be important, but we must not entertain the idea, that the proper management of the land consists in the adoption of that principle only; for, in the strictest sense of the word, pulverization is of no other benefit to the plants which grow in the soil, than that it increases the number of their fibrous roots or mouths, by which they imbibe their food, thereby facilitating the more perfect preparation of that food, and conducting it so prepared more regularly to their roots. Ground should never, for any length of time, lie uncultivated, or without being cropped, unless for the purpose of giving it rest; and in that case, as soon as the crop is cleared off, all the refuse, which is left on the ground, should immediately be dug in; this would not only have a tendency to improve the ground, but would give the garden always a more neat and orderly appearance, and a considerable degree of labor would be thereby economised in the destruction of weeds. The time which it would take to hoe, rake, and clear off the rubbish of a quarter of the garden, when the crops are removed, will be almost equal to that, which it would take to dig it over; and, in some cases, more time would be occupied, independently of the loss of the vegetable matter raked off, and which is carried off

either to the rubbish-heap, or most generally thrown out into the woods, and therefore lost for ever. In most cases, the ground should be thrown up as rough as possible, presenting as large a surface to the action of the air as possible. Where the soil is of a stiff clay, no operation that can be performed within a garden, can be of such effectual use, as fallowing. It not only pulverizes the soil, but effectually clears it of weeds. When once weeds of the rooting sorts, such as, *Ranunculus*, *Triticum*, and some others, overrun a stiff clayey soil, no means can be adopted so likely to be attended with success in eradicating them, as fallowing; and that process is not to be confined merely to digging over the ground, and leaving it in that state for months, till it becomes as bad as it was at first, but it must be followed up by repeated digging, raking, and hoeing, and never allowing the roots time to draw any nourishment from, nor to re-establish themselves in the ground; this will at length exhaust them, and clear the ground of them entirely. Supposing, therefore, that no other advantage were obtained, that no nutritive matter was imbibed from the atmosphere, and the soil was neither chemically nor mechanically improved by the operation, the benefit alone arising from the eradication of the weeds is sufficient to justify its practice.

The advantages of aeration, or fallowing, either in winter or summer, are important; and although that great experimenter, Sir Humphry Davy, treats the matter lightly, yet the long experience of intelligent agriculturists and gardeners convinces us of the great benefit arising from its practice. One obvious advantage of summer fallowing, they say, is, that the soil may be thereby heated by the sun to a degree, which it never could attain, if partially covered with the foliage of even the widest drilled crops. If the soil be laid up in rough ridges, or with its surface as rough as it possibly can be, it will consequently receive a greater quantity of heat, and will retain that heat longer, by means of the rough pieces thus heated, reflecting back the heat imbibed by each other.

By the aeration of lands in winter, their minute mechanical division is obtained by the freezing of the water in the soil, for as water, when frozen, occupies more space than when in a fluid

state, the particles of earthy matter, and of stones liable to decomposition, are thus rent asunder, and crumble down into a fine mould. Independently of the benefits thus derived to the soil, the roots of weeds, insects and their eggs, are destroyed in greater quantities, than is generally supposed.

Strong stubborn soils may be improved by burning, but this is more a matter of agriculture than horticulture. Light ones may be improved by compression, but neither of these soils is very proper for a garden.

In the improvement of soils by the operation of trenching, particular care must be taken to perform it in moderation, that is, to trench the ground according to the depth of the soil. A garden-grounds should be from two to three feet deep of good mould, either natural or artificial, and for the quarters of gardens, this will be amply sufficient. The fruit-tree borders must of course be of various depths, according to the nature of the trees planted in them. In trenching too deep, much injury may be committed, as the better parts of the soil will thereby be buried, and the subsoil brought up to the surface in its crude state, which is wholly unfit for the nourishment of vegetables. The late Mr. Nicol adopted a very rational method of trenching, which is as follows: "Take three crops off the first surface, and then trench three spit deep, by which the bottom and top are reversed, and the middle remains in the middle. Take three crops off this surface, and then trench two spit; by which the top becomes the middle, and the middle the top; and take also three crops off this surface, and then trench three spit, whereby that which was last the middle, and now top, becomes the bottom, and that which is now the bottom, and was the surface at first, now becomes surface again, after having rested six years. Proceed in this manner alternately, the one time trenching two spit deep, and the other three, by which means the surface will be always changed, and will rest six and produce three years. Hence there will always be new soil," (or, that is, soil greatly renovated, there being no such thing in reality as new soil,) "in the garden, for the production of wholesome vegetables; and hence also will much less manure be required, than when the soil is shallow, and the same surface constantly in crop." He goes on to say, upon the supposi-

tion that the soil is not sufficiently deep to admit of trenching three spit deep; "in situations where the soil is only so deep to allow of trenching two spit, and where expense in making it deeper may be grudged, the above hint may also be followed with advantage, as by regularly trenching every third or fourth year, the ground will rest half its time; and, if judiciously managed and cropped in proper rotation, wholesome vegetables may be produced in it for many years successively."

There are few instances where a garden can be trenched all in one year, neither is there any necessity for it, one division, quarter, or break, may be conveniently trenched annually, without interrupting the ordinary routine of business; and, perhaps, in no way more conveniently than that recommended for planting the autumnal crops of the different species of cabbage.

A considerable expenditure will be saved, if the choice has been made of a soil of such a nature proper for the formation of a garden. Strong stubborn clays are to be avoided, being the most unfit of all others, as few vegetables will prosper in them, and the expense of rendering them more congenial will not only be excessive, but many years must expire, before all the power of art can ameliorate them in any tolerable degree; and even then, they will be imperfect, as the clay will always have the predominant influence. Sand, lime, chalk, (where it can be procured,) and coal-ashes, correct the tenacity of clayey soils, and make them work more pleasantly; the former, if sharp, or if it be river or sea-sand, with a mixture of shells, will, if dug in, in a sufficient quantity, render it of a lighter texture. Chalk should be spread on the surface in autumn, so that the whole may be pulverized by the action of the winter's frost and rains, and dug in, in spring. It corrects the acidity of the clay, as well as renders it more friable. Lime acts much in the same way, but should be used more sparingly. Coal-ashes have much the same effect upon stiff soils. Lime rubbish dug in, is a good corrector of stiff soils, and is less objectionable than the coal-ashes. Decayed tanners' bark, bog-mould, or any vegetable mould applied to strong soils lightens them considerably. Such soils cannot be too much wrought by the spade; every opportunity should be taken to ridge and rough-dig strong soils,

and such operations should not be done in wet weather, nor when the ground has been saturated with wet.

Gravelly soils are also very unfit for garden ground, as being generally of themselves sterile, and not readily enriched by manures, the finer particles of which are washed off by the rains; and they are also subject to suffer much from drought in summer, as they are not capable of retaining a sufficient quantity of moisture to support the crops in dry weather. Such soils are capable of improvement, by divesting them of the greater portion of small stones, and by the addition of strong loam, or even any tolerably good earth; and this must be applied in quantities sufficient to form a body capable of retaining a sufficient quantity of moisture for the support of future crops. Light sandy, or even gravelly soils, are, however, not without their advantages, because they are much warmer, and by affording a much less quantity of moisture, the crops will not grow so luxuriantly, and therefore be much sooner fit for use than those, which are grown on strong clayey soils. Early spring and winter crops are not only much earlier on sandy soils than upon clayey, but are also much more capable of resisting the frost. On the approach, however, of the summer's drought, the crops either fail entirely, or else are unproductive and of short duration.

The soil most proper for the purpose of garden culture should, therefore, be neither too strong nor clayey, nor of too loose and gravelly a quality, but of a rich and rather a light pliant nature, capable of being wrought at all seasons without inconvenience, and of sufficient depth to allow the roots of all sorts of trees and plants to extend themselves with facility. Black vegetable, hazelly brown, and chestnut-coloured loams, are all proper for the purpose of garden ground; and all those, which are of a more stiff and tenacious nature, or too loose, and insufficient to support trees and plants, must be made good by the application of such substances as are of a contrary nature. In procuring mould, either for improving or renewing the soil, care should be taken to prefer such only as is near the surface, as it is in general the most productive and fruitful, and is in reality, the true vegetable earth. The top spit, that is, to the depth of one foot from the surface of any common or field,

which has not been much cropped, is to be preferred, and the fuller it is of fibrous matter, the better it will prove for the growth of the plants. Soils of the best quality will be much improved by occasional top dressings of such mould, either applied in its fresh state, or after having been partially ameliorated by being kept in the compost yard for a few months before it is used.

Mould dug from a greater depth is not fit for use in its crude state, but should be exposed a twelvemonth at least to the action of the weather, and even then, it is deficient of most of the vegetable and animal matter, of which the top spit is chiefly composed.

CHAP. III.

VARIETY AND USES OF MANURES.

VEGETABLES are found by chemical analysis to be composed of oxygen, hydrogen, carbon, and nitrogen, or azote, with a small portion of saline bodies. It is evident, therefore, that the substances employed as manures, should also be composed of those elements, for unless they are, there will be a deficiency in some of the elements in the vegetable itself; and it is probable, that such deficiency may prevent the formation of those substances within it, for which its peculiar organization is contrived, and on which its healthy existence depends. Of these elementary bodies, oxygen, hydrogen and carbon, are contained in vegetable, and the whole of them in animal matter. Nitrogen is sometimes, but rarely, found in vegetable matter. These, with certain salts, form the food or manures of vegetables.

The manures in general use in gardens are numerous, but we shall only notice those, which are considered the most useful, and of these, the dung of horses, if not the best, is certainly the most general in use. With this dung, in different states of

fermentation, we grow many of the tropical and exotic fruits and vegetables, which the inclemency of our climate prevents us having in the open air; and after it is of no farther use in those departments, we carry it out to manure our lands. This practice, however prevalent, is condemned by Sir H. Davy and other chemists, who assert that, by undergoing fermentation beyond a certain limit, the principles of manure, or those parts which really constitute the food of vegetables, are lost. All gardeners, however, agree in using manures after they have undergone a certain degree of fermentation, without which, it is supposed they would communicate a rank and disagreeable flavour to fruits and vegetables, and if applied in an immoderate quantity, would, in a considerable degree, give an unwholesomeness to the juices of all plants. To what particular degree this fermentation should be carried, before the manure be laid on the soil, deserves our particular attention.

That slight fermentation is of use before application, is undoubted, for by means of it, a disposition is brought on in the woody fibre to decay and dissolve, when it is carried and dug into the soil; too great a degree of fermentation is, however, very prejudicial to the manure. It is better, says Sir H. Davy, that there should be no fermentation at all, than that it should be carried too far. The excess of fermentation, he adds, tends to the dissipation and destruction of the most useful parts of the manure, and the ultimate results of this process are like those of combustion. It is a common practice to suffer dung to ferment till the fibrous texture of the vegetable matter be entirely broken down, and till the manure becomes perfectly cold and soft: this is the case generally of dung, which has been employed in melon or other hot-beds, and which is generally preferred and used by practical gardeners. During the process of fermentation necessary to reduce it to this state of decay, not only a large portion of fluid, but also of gaseous matter is lost, so much so, that the dung is often reduced to less than two-thirds of its original weight; and the principal elastic matter, which is lost or disengaged, is carbonic acid with some ammonia, either of which, if retained or conveyed to the soil, is capable of yielding a considerable degree of useful nourishment to plants.

It is also argued in favour of unfermented dung, that it goes much farther; if this really be the case, and that it produces no bad effect on the fruits and vegetables, it will be important to devise other means of producing heat for the production of forced vegetables, and by so doing, reserve for the soil that proper nourishment, which is designed by nature for the food of plants. But this is a matter of much less consequence to the gardener, than it is to the farmer. The former has generally much less space to go over, and his productions are generally of such a description, as to be more sensibly affected by the application of crude and unprepared manures, which are apt to communicate a rank and disagreeable flavour to vegetables, and are productive of serious injury to the roots of tender fruit-trees, if applied in certain quantities and qualities. In most cases, therefore, we would recommend the application of manure which has undergone a degree of fermentation in the hot-bed; or if it has remained two or three months in that state, it will not be too much, unless fermentation has been greatly excited. In this state, it will be better for the garden than dung quite fresh, or that which may have lain for a twelvemonth.

The following table shows the relative constitution of common stable manure, and our usual crops.

<i>Stable Manure.</i>	<i>Crops.</i>
Carbon,	} These are chief components of all plants;
Hydrogen,	
Oxygen,	
Nitrogen,	In some vegetables;
Carbonate of Lime,	In almost all plants;
Muriate of Potash,	In Cucumbers, Garlic, &c.;
Muriate of Soda,	Perhaps in all plants;
Sulphate of Potash,	In Cucumbers, Garlic, &c.;
Magnesia,	In all corn, and many other plants;
Phosphate of Lime,	Potatoes, Onions, &c. &c.;
Oxide of Iron,	In most plants;
Alumina,	} In most plants.
Silica,	

Next to the dung of horses, that of oxen and other cattle is in general use, and if slightly fermented, is an excellent ma-

nure for light hot soils; it is also well calculated for soils of a dry absorbent nature, as it retains its moisture for a greater length of time than most others.

Green vegetable matter is an excellent manure, but less attended to than it ought to be. All plants in a succulent state contain much saccharine or mucilaginous matter, and therefore cannot be used too soon after their death. It has been the practice to carry all vegetable matter considered as useless to the compost yard, and, by collecting it in a mass, a quantity of vegetable mould or manure, has thus been procured; but this is a great waste of the best parts of the manure, and should only be adopted when such vegetable mould may be required for particular purposes. Instead of collecting all the weeds, useless vegetables, &c., in a garden to one heap, let the following simple mode be adopted. When a piece of ground is going to be dug, go round and collect all the decaying vegetables, &c., and immediately dig them in. The sweepings of grass-walks and lawns are also of much use as a vegetable manure; and on being brought every day into the garden, they should be dug in, before fermentation commences. But it must be observed that they should not be buried at too great a depth, otherwise fermentation will be prevented by compression, and the exclusion of air. Green crops, pond-weeds, the parings of hedges or ditches, fresh turf, or any kind of fresh vegetable manure, require no preparation to fit them for manure. The decomposition slowly proceeds under ground, the soluble matters are gradually dissolved, and the slight fermentation that goes on, checked by the want of a free communication of air, tends to render the woody fibre soluble, without occasioning the rapid dissipation of elastic matter.

Sea-weeds, where they can be procured, make excellent manure for most vegetables, but particularly for sea-kale, artichokes, and asparagus. This manure is transient in its effects, and does not last more than for a single crop, which is accounted for by its containing a large portion of water, or the elements thereof. It decays without producing heat when exposed to the atmosphere, and seems, as it were, to melt down and dissolve away. It is sometimes suffered to ferment before it is used, but this is quite unnecessary, for there is no fibrous

matter rendered soluble by that process, and a part of the manure is therefore lost. The best cultivators use it, as fresh as it can be procured, and the practical results of this mode are exactly conformable to the theory of its operation. The carbonic acid, formed by its incipient fermentation, must be partly dissolved by the water which is set free in the same process, and thus becomes capable of being absorbed by the roots of plants. As a manure, the effects of sea-weed must depend on this carbonic acid, and on the soluble mucilage which it may contain. Some fucus has been found to have lost half its weight by fermentation, and afforded less than one-twelfth of mucilaginous matter; from this we may conclude, that some of this substance is destroyed in the course of fermentation.

The dung of birds, either wild or domesticated, affords a powerful manure, particularly that of the former. We are informed by Humbold, that the *guano*, which is used to fertilize the barren plains of Peru, is employed in such quantities for the maize crops, that fifty vessels are laden with it annually at Chinche, each of which carries from fifteen hundred to two thousand cubical feet.

Pigeon's dung was, and still is, in great esteem in Persia, where they manure their melons with it, and was sold at a high price during the famine in Samaria, when a cab, *not quite three pints corn measure*, sold for five pieces of silver. It is a powerful manure, and should only be used as a compound, or if used as a simple, the greatest care must be observed in the distribution of it. We have found it the best manure for strawberries of any which we have tried. If used as a compound with fresh loam, cow-dung, or other manure, it should lie for some time to be sufficiently incorporated, so as to admit of equal distribution.

The dung of sheep and deer affords good manure, but is seldom used in gardens; nevertheless, if circumstances would admit of it, sheep folded for a few nights on any spare garden-ground would do much to improve it; in such a case, however, it would be necessary to have it dug in as soon as possible, as by lying long on the ground, the better parts of it soon escape by evaporation. Its chemical properties are nearly

the same, and, by long boiling in water, are found to afford soluble matters, which equal from two to three per cent. of their weight. These soluble substances, which are produced by solution and evaporation, contain, when examined, a small quantity of matter analogous to animal mucus, and are principally composed of bitter extract, soluble both in water and alcohol. They give ammoniacal fumes by distillation, and differ very little in composition.

Soot is a very powerful manure, and ought to be used in a dry state, and thrown on the surface of the ground. It is supposed to be a preventive, to a certain extent, to wire-worms and maggots. This is, probably, owing to its bitter extract, which it gives out to hot water. It likewise contains an empyreumatic oil. It has been used on crops of onions; it is sown at all times with good effect, and where it has been sown, no maggot has appeared. It also has been used for a like purpose on garden and pasture-land, most probably for the extinction of the wire-worm, but a solution of it in water would perhaps be preferable.

Bones have of late years been much used for a manure. After they have been boiled for the grease which they contain, they are then sold for manure, and have been strongly recommended for vine borders. The expense of collecting and grinding them is too great to allow of their general adoption.

Horn is a similar manure to bone, only much more powerful, as it contains a larger quantity of decomposable animal matter. The shavings or dust of horn, form an excellent manure, but, like the dust of bones, are not to be obtained in sufficient quantities to be of general use.

Blood contains a certain quantity of all the principles found in other animal substances, and is, consequently, a good manure. It may be collected in some quantities at the slaughter-houses of butchers in large towns, and where sugar manufactories are carried on, bullocks' blood being used there in the process of separating by the heat of the boiler, the impurities of brown sugar, by the coagulation of its albuminous matter.

Much has been said of late years for and against the use of salt as a manure. Mr. Joseph Hayward, the ingenious author of the *Science of Horticulture*, &c., observes, after making

many experiments with sea-salt, nitre, soda, barilla, alum, &c. that he never found them operate so as a proportional addition of food might be expected to do, and draws the following conclusion: "Notwithstanding all that has been said to establish the opinion, that sea-salt is a valuable manure, I am convinced it never can, as an article of food, contribute to the increase of any vegetable; but as a chemical agent, by destroying and facilitating the decomposition of animals and vegetables, or by its deliquescence, it may, in some instances, increase the fertility of the soil."

Urine of most animals affords a good liquid manure, but it is necessary to use it as soon as possible, as it is liable to undergo the putrefactive process, and the urine of some animals putrifies more rapidly than that of others. It should never be applied as a simple; and if not mixed with solid matter, it should be diluted with water. When pure, it contains too large a portion of animal matter to form a proper nourishing fluid for the absorption of plants.

The ashes of wood, if not too much burnt, are said to be a lasting manure; this, however, must depend on the quantity of charcoal which they may contain, resulting most probably from the slow and gradual consumption of the charcoal parts. These ashes are obtained in considerable quantities from lime or brick-kilns, where wood is used for burning. They are generally sown among turnips, and are supposed to be of use in protecting them from the fly. Charcoal-dust may be often obtained, where it is made for the iron manufactories, or for domestic purposes. This dust gives out its fertilizing properties in the most slow and gradual manner possible.

Saw-dust, shavings, and tanners' bark, are sometimes applied as manure; but as they are mere woody fibre, which is the only vegetable matter that requires fermentation to render it nutritive to plants, little good is to be expected from their application. Either of them, however, may be used as a corrector of strong lands, without doing any injury, if not applied in an immoderate quantity. All animal substances are powerful manures, and require no chemical preparation to fit them for the soil. The great object is to blend them with other matters, so as to prevent their too rapid decomposition.

Of all mineral manures, lime is most known, and generally used, and various have been the conjectures regarding the method of its application. It is generally used either as quick lime, that is, in the state immediately after being burnt, and before it has been much exposed to the action of atmospheric air, or before water has been applied to it. It is also used as mild lime, which is quick lime exposed for a certain time to the action of the atmosphere. The solution of the question, whether quick lime should be applied to a soil, depends on the quantity of inert vegetable matter that it contains; and the solution of the question, whether marl, mild lime, or powdered limestone ought to be applied, depends on the quantity of calcareous matter already in the soil. All soils which do not effervesce with acids are improved by mild lime, and ultimately by quick lime. Sands are more improved by lime than clays. When a soil, which is deficient in calcareous matter, contains much soluble vegetable manure, the application of quick lime should always be avoided, as it tends either to decompose the soluble matters, by uniting to them carbon and oxygen, so as to become mild lime; or it combines with the soluble matters, and forms those compounds, which have less attraction for water, than the pure vegetable substances: the case is the same with respect to most animal manures, but the operation of the lime is different in various cases, and depends on the nature of the animal matter. Lime forms a kind of insoluble soap with oily matters, and then gradually decomposes them by separating from them their oxygenic and carbonic properties. It combines also with the animal acids, and probably assists their decomposition by abstracting carbonaceous matter from them combined with oxygen, and consequently it must render them less nutritive. It tends, likewise, from the same causes, to diminish the nutritive powers of albumen, and always destroys, to a certain extent, the efficacy of animal manures, either by entering into combination with certain of their elements, or by giving them a new arrangement.

Lime should never be applied with animal manures, unless they be too rich, or for the purpose of preventing noxious effluvia. It is injurious, when mixed with any common dung, and tends to render the extractive matter insoluble. All limes

have not the same effect; lime-stones, containing *alumine* and *silica*, are less fitted for the purpose of manure, than pure lime-stone; but the lime formed from them has no noxious quality: such stones are less efficacious, merely because they furnish a less quantity of quick lime. There is seldom any considerable portion of coaly matter in bituminous lime-stones, never exceeding five parts in one hundred, but such lime-stones make very good lime. The carbonaceous matter can do no injury to the land, and may, under certain circumstances, become a food for the plant. Lime that contains certain portions of magnesia has been found to do much injury to the crops on which it has been applied; while, in other cases, it has been found to be productive of much good. It is a general remark, that lime containing magnesia may be applied in large quantities to *peats*; and that when lands have been injured by the application of too large a portion of magnesian lime, *peat* will be the most proper and efficient remedy. Nitric acid, or aquafortis, is a simple test to detect the presence of magnesia in lime-stone. The application is to steep the stone in the diluted liquid, and the magnesia will be detected by its turning the liquid of a milky hue. Magnesian lime-stones are usually of a brown or pale yellow color.

Coal was first discovered by Hazenfrez to be an essential ingredient in the food of vegetables, and is now used as a manure with good effect. Mr. Kirwan observes, that coal, "though hitherto little attended to, appears to be one of the primeval principles, as ancient as the present constitution of our globe; for it is formed in fixed air, of which it constitutes above one-fourth part, and fixed air exists in lime-stones, and other substances, which have their date from the origin of things."

Manures, whether animal or mineral, are of such importance to vegetation, that we should use all possible diligence in the collecting and preparing of them for the different purposes, for which they may be required. By a proper application of them, and by a rotation of cropping, founded on just principles, the worst garden-ground may be not only improved, but rendered fit for the production of every vegetable, that is usually cultivated in these islands.

For the more convenient preparation of compost manures, a piece of ground, to which all fertilizing matter is to be carried, should be enclosed near the garden, and so situated as to enjoy the full influence of sun and rain, there to be incorporated, fermented, and prepared for the several purposes for which they may be wanted. In this place should also be accumulated all sorts of moulds, for the greater convenience of having them ameliorated, and rendered fit for their destined purposes; either to be mixed in composition with other manures, or to be used simply for the growth of peculiar plants, or for improving and renewing such pieces of garden-land as may require it. In collecting these moulds, recourse must be had to the fields and commons, where they are to be obtained. No pains should be spared in collecting a sufficient quantity, and they should be applied with an unsparing hand to those parts of the garden which may require them. But when it happens, as is often the case from a variety of circumstances, that moulds of good quality cannot be easily procured, a rigid care must be taken of them, as they will be required for some of the more delicate plants; and substitutes must be devised when such moulds are not to be had in their primitive state, which may be effected by blending substances of opposite principles, which often produce a compound extremely well calculated to promote the welfare of certain plants. No opportunity should be lost in collecting earths of various sorts from all places where they are to be procured. The scrapings of turnpike roads are a useful manure in strong lands, provided the roads be composed of gravelly or chalky materials. Thus road-sand formed of pounded flints, which is often to be met with, is not only an excellent manure and a lightener of strong lands, but also makes very good walks, which are both dry and easily kept clean.

The following method of obtaining a cheap and efficacious manure, is recommended by Mr. James Reed, of Bristol. Raise a platform of earth, on any spare piece of land, eight feet wide, one foot high, and of any length according to the quantity wanted. On the first stratum of earth lay a thin stratum of lime, fresh from the kiln; dissolve or slack this with brine from the rose of a watering-pot, and immediately add

another layer of earth; then lime and brine as before, carrying it to any convenient height. In a week, it should be turned over, carefully broken and mixed, so that the whole mass may be thoroughly incorporated. This compost has been used in Ireland; has doubled the crops of potatoes and cabbages, and is said to be far superior to stable dung.

CHAP. IV.

DRAINING, ITS VARIETIES AND EFFECTS.

DRAINING must be acknowledged as the principal step towards the improvement of soils, particularly such as are, either from their natural situations, overcharged with moisture, arising from their lying below the general level of the surrounding grounds, or from the existence of natural springs within them. Although this be a subject, which falls more particularly under the arrangement of the agriculturist, it is nevertheless of the first importance to the gardener. Soils naturally wet, or subject to excess of moisture from various causes, are of all others the least fit for the operations of garden-culture. Circumstances, however, may occur, when from a want of sufficient choice of situation, the garden may be so placed as to require to be rendered perfectly dry by artificial means; and indeed in all situations, draining should be particularly attended to, were it for no other purpose than to carry off the superfluous moisture occasioned by heavy or long-continued rains. As a precautionary measure, we would recommend, that whatever the soil or situation may be, it should be sufficiently and substantially drained before any attempts be made for further improvements. Soils naturally wet, are cold and late; however abundantly they may produce certain crops during the heat of summer, are, nevertheless, to the majority of garden productions, attended with the most injurious consequences. Although plants will not live without water, a superabundance of it is equally detrimental to them, particularly when it remains stag-

nant at their roots, by obstructing perspiration and intro-susception; and whenever that be the case, they soon become diseased and ultimately die.

The process of draining is performed in a variety of ways, according to the soil to be operated upon, and the materials of which they are to be constructed. Our limits will not admit of entering into the details of the different varieties and sub-varieties of draining, neither is it at all necessary for our purpose, as the extent of ground, under the most unfavourable circumstances in the formation of a garden, is capable of being rendered perfectly dry by the ordinary methods of draining.

Water, like all other fluids, remains stationary when obstructed, but when unobstructed, proceeds by the force of its own gravity. A tube filled with water, and placed perfectly horizontally, with both ends open, the liquid will flow equally at both ends; but elevate one of the ends of the tube, and the water will flow out at the other with a rapidity proportionable to the elevation of the tube and the weight or quantity of water it contains. In the process of draining, therefore, the main or principal drains should be formed on an inclined plane, into which the smaller or collecting drains should empty themselves, and the greater the fall of the principal drains, the more readily will they discharge the water collected in them. The principal drains should commence at a considerable distance from the garden, so as to admit of their discharging their contents at a proper distance from it, and they should extend in a direction towards the hot-houses, sheds, or other horticultural erections, and also to those points, which indicate any appearance of springs or superabundance of moisture; and, as we have before noticed, for the greater facility of repairing or examining them at any future period, they should run under the walks as far as the nature of the situation will admit.

The materials of which drains are composed are various, and depend on the facility with which they can be procured. In situations, where stones can be had, they make the best and most lasting drains; flints, chalk in large pieces, which have not been exposed to the air for any length of time, and brick-bats, are all excellent materials for drains. Brush-wood

is not unfrequently used in countries where none of the above-mentioned materials are to be procured, and although making a less permanent drain, will, for a few years, act sufficiently, yet, from the liability of wood to decay, it is probably the worst material that can be chosen for this purpose. Earthenware tiles of various forms and sizes, have been used for draining, but these materials are better adapted for carrying off the water when once collected, than for the actual purpose of collecting it; however, they are sometimes made perforated with a considerable number of holes for the purpose of admitting the water into them. For lands liable to sudden inundations, tile-draining is excellent, and the nearer the surface they are, provided they be under the reach of the plough or spade, the more effectually will they act. Whichever of these materials be used, it is important that they be laid as hollow as possible, that the water may the more readily find a passage through them; and, in forming the main or principal drains, they should be built, so as to leave an open space, at least nine inches or a foot square, at their bottoms; over this should be laid, in an open manner, a sufficiency of the same material wherewith to fill the drains to within a few inches of the surface of the walks, if the drains be placed under them, and to within fifteen or eighteen inches of the surface of the ground, when they are under the quarters or borders. The depth at which these principal drains should run, can only be determined by local circumstances; but the collecting or cross drains need not be either so deep nor yet so broad, neither is it requisite that they should be built with a cavity so capacious. For most purposes, a space of a few inches in the clear will be sufficient, and should be formed of the following shape, Λ , which is readily done by placing the larger pieces of the materials resting against each other at the top, and thus forming a rude, though strong arch, capable of resisting any pressure, which is likely to be placed upon it. Like the main drains, the nearer to the surface these smaller ones can be filled with porous materials, the better will they collect and carry off the superabundant water. In draining with brush-wood, no cavity is usually formed, although no doubt can exist that for principal drains, two planks laid so as to leave

a triangular vacuity under them would be beneficial in its effects, and admit of the water passing more readily off. Where gravel is to be had, excellent drains may be formed by introducing drain tiles in the bottom, and filling up the remainder of the drain to a sufficient depth with coarse gravel; and, in such cases, the expense of screening out the finer particles through a coarse screen will be repaid by facilitating the escape of the water. Consistently with a previous observation, chalk, when newly dug, and when it runs in large pieces, makes drains equal to stone, but it must be used before being exposed to the action of the atmosphere, for when once charged with moisture, and exposed to frost, it becomes pulverized; but if used soon after it is dug, it will last for ages, and of itself absorb a large portion of moisture. Heath and furze are not unfrequently used for draining when no better materials can be procured, but when laid in quantities even considerably below the surface, and beyond the action of the air, they are liable, from their disposition, to ferment. They may be used for temporary draining, and for that purpose are often employed by agriculturists; but in draining ground for garden-purposes, the inconvenience which arises in repairing such drains is so great as to render all kinds of temporary draining, radically bad. There are few soils, during their preparation for garden-purposes, which do not afford a considerable quantity of stones, gravel, &c., and the refuse in the erection of walls, hot-houses, &c., if collected, will supply, in many cases, sufficient materials for this purpose. When they are found inadequate, recourse must be had to other sources to supply the deficiency. Draining, although long practised in the improvement of soils, has only of late years been properly understood; and it must be admitted, that too little attention is generally paid to this important point, in the first formation of many gardens. Whenever that be the case, the defects will for ever be obvious in the diseased state of the fruit-bearing trees, and in the late and unproductive crops of the most common vegetables.

When the garden is so situated as to be subject to occasional floodings, from the rapid melting of snow or sudden falls of rain, which is frequently the case, when lying at the foot of hills, or on steep declivities, it is often necessary in such cases

to open drains along their highest side, on the exterior of the boundary fence, to cut off the possibility of its entering into the ground, which, were it permitted to do, the consequences would be fatal to many of the smaller crops, by washing a great portion of earthy matter over them, and repeated inundations of this kind would ultimately carry off the greater and better portion of the soil from the most elevated parts, and deposit it in those parts, which are lower.

As these floods are generally confined to the surface-drains for their reception, they need not be deep, provided that they be regularly cleared of filth, which will naturally accumulate in them. But as this is a matter not always attended to, it is better to make them of a considerable depth in the first instance, say from three to four feet, according to local circumstances. Where land-floods are not apprehended, it also becomes necessary in many instances, where the declivity is great, or the situation placed at the bottom of rising grounds, to make considerable drains for the purpose of cutting off the quantity of water, which naturally flows from them. For this latter purpose, it is requisite they should be cut to a much greater depth, in order the better to intercept the water, as it flows through the strata, which, in many cases, are several feet below the surface. Unless such drains are sunk below the channels through which the water flows, little good can be expected to arise from them. Deep open drains are objectionable, inasmuch as they occupy a considerable space of ground, which is thereby rendered almost useless; still, for this and similar purposes, they have a decided advantage over those, that are filled up even with good materials, by cutting off more effectually the flow of water. Drains for this purpose might be readily constructed so as to answer both purposes, by filling up the bottom part of them, as already recommended for principal or main drains, and leaving the upper half in form of an open drain, sloping the banks back to prevent their falling in.

Willows and dwarf trees or shrubs may be advantageously planted on their banks, and would soon hide them, where that is deemed necessary. The depth to which drains should be cut depends in all cases on the nature of the soil, the depth of

springs, and other circumstances for which no direct rules can be laid down. We, however, may go so far as to say, that deep clayey soils seldom require deep draining; their natural closeness of texture preventing the process of filtration from going on; and if rendering the surface dry, be the object in view, the drains cannot well be made too shallow, provided that they do not impede the necessary operations of digging and trenching: for such soils, three feet may be esteemed an average depth for the collecting drains, but the principal ones should always be regulated in depth by the level necessary for carrying off the water.

Where the soil is of a mossy nature, the effects will be more complete if the stratum be completely cut through, as the water will be found in such cases to flow in greater quantities between that, and the stratum immediately beneath it. Gravelly soils are of all others most effectually drained, even should they be charged with a greater quantity of water; for as it is of all soils the most porous, the water consequently finds a more ready passage through them. As draining is attended with a great expense when carried to any considerable extent, the least quantity of solid matter to be removed becomes important; hence it follows, that the narrower that they can be cut, the less expense will attend the operation, and a less quantity of draining materials will be required to fill them. As a general rule, from which there are few exceptions, they should not be cut broader, than merely sufficient to admit of the operators getting to a sufficient depth; and in most cases, where no obstacle, such as rock occurs, for drains of four feet in depth, two feet in width will be amply sufficient, but for drains of greater depth, the breadth must be increased accordingly.

Deep drains should always be filled up and finished as the operation of excavation goes on, for if they be left open long they not unfrequently fall in, and often render the labor and expense doubly great. When drains are made up to their proper height with stones, or any of the substitutes recommended, a small quantity of heath, straw, or shavings, should be put over the stones to prevent the finer particles of soil filling up the crevices between them, and where none of

these can be conveniently got, thin turf laid with the green side undermost will be an excellent substitute.

The season best calculated for the process of draining is either late in autumn or early in spring, at which periods, the springs are high; the probability, therefore, of detecting their course is then more likely to be attained than at any other period during summer, when the quantity of water will be lessened by evaporation, or during the winter months, when the springs also become low or are impeded by the frost.

CHAP. V.

SYSTEMATIC ALTERNATION OF CROPS.

IN the cultivation of the ground, either in farming or gardening, a proper attention to the regular rotation of crops forms one of the first and principal features of good management, although its beneficial influence has not yet been fully accounted for by chymists. The rationale of rotation is thus given by Sir Humphry Davy: "It is a great advantage in the convertible systems of cultivation, that the whole of the manure be employed; and that those parts of it, which are not fitted for one crop, remain as nourishment for another. Thus, if the turnip be the first in order of succession, this crop manured with recent dung immediately finds sufficient soluble matter for its nourishment, and the heat produced by fermentation assists the germination of the seed, and the growth of the plant. If after turnips, barley with grass-seed be sown, then the land being but little exhausted by the turnip crop, affords the soluble parts of the decomposing manure to the grain. The grasses, rye-grass, and clover remain, which derive a small part only of their organized matter from the soil, and probably consume the gypsum in the manure, which would be useless to other crops; these plants, likewise, by their large system of

leaves, absorb a considerable quantity of nourishment from the atmosphere, and when ploughed in, at the end of two years, the decay of their roots and leaves affords manure for the wheat crop; and, at this period of the course, the woody fibre of the farm-yard manure, which contains the phosphate of lime, and the other difficultly soluble parts, are broken down, and as soon as the most exhausting crop is taken, recent manure is again applied."

Gardeners should pay particular attention to rotation of crops, as far as the nature of the thing will admit of; a good practice is to sow down part of the garden every season in grass, clover, and barley, which may be used as green food for horses and cows. The barley should be sown with the clover, and cut down, not being allowed to ripen; thus it acts as a nurse and a shade to the clover. But, in all cases where this is done, let the ground be laid down in as good condition as possible, and the manure laid on will not be lost. Land thus laid down in grass should continue so for two years, or if for three the greater will be the benefit. However, this is generally regulated by the quantity of ground which can be spared from crops, for the time when the ground is wanted. The crop of grass, if dug in, but not too deep, for reasons given already, will materially improve the soil; but on no occasion whatever trench it in, as is too often the case. This practice, although excellent, can however only be applied to gardens on a large extent; for its adoption would not be attended with the same advantages in the general run of our gardens.

By a rotation of the perennial crops, such as quartering out currants, gooseberries, and raspberries, &c., the ground will not only be renewed, but also rested, or at least very much improved. None of these crops need occupy the ground above twelve years, and not less than three; this, together with trenching for the principal crops of autumn-planted brassica will keep the ground in fresh order, and be attended with no loss of space; for in all large gardens, and the generality of small ones, new plantations of these things should be made to a certain extent annually, which will throw a certain proportion of ground into regular rotation. In cropping all gardens, as far as it can be rendered practicable, rotation

should be aimed at, and thus, by keeping all the legumes, as peas and beans, the brassica or cabbage kinds, the bulbous or onion kinds, and lighter crops, as salads, &c., by themselves, each following in regular succession, the garden would not only look better, but would, to a certain degree, produce the rotation required. In no case should any of the brassica tribe follow another upon the same piece of ground, neither should peas follow peas, nor beans, beans; onions are, probably, the only exception in garden culture. A journal, or plan of the garden should be kept, and the ground divided into portions, each of which should be numbered, and a careful record kept of all crops, manurings, trenchings, &c.

The necessity of rotation is pointed out to us by nature; for all perennial herbaceous plants have a tendency to extend their circumference, and to rot and decay at their centre, where others of a different kind, spring up and succeed them. This is particularly exemplified in the strawberry, and all such stoloniferous growing plants; mushrooms are said never to rise two successive years on the same spot. The production of the phænomenon, called fairy rings, has been ascribed to the power of the peculiar fungus, (*Agaricus orcadæ*), which forms it, of exhausting the soil of the nutriment necessary for the growth of the species. The consequence of which is, that the ring extends itself annually, as no seeds will grow where their parents grew before them; at the same time, that the interior of the circle has been exhausted by succeeding crops; but in those places, where the fungus has died, grass has grown luxuriantly, nourishment being thus left for the support of grass and other plants, after the agaricus has exhausted all that was destined by nature for it.

All crops for a few years thrive well on newly turned up virgin mould, but in a few years they degenerate and require a fresh soil. Land, in the course of years, often ceases to produce the most common vegetables, and fields which are well laid down with cultivated grasses, lose every one of them in a few years; they become, as it were, tired of them, but the truth is, that they have exhausted the nourishment proper for their respective sorts, and consequently die, and give place to others. This fact is frequently experienced by botanists

to their regret, for a plant is often found in abundance for years, in one field or wood, and in course of time wholly disappears.

A change of crops is founded on an acknowledged fact, that each sort of plant draws a nourishment peculiar to itself. On this principle, after a piece of ground has nourished one crop, another of a different description may succeed. Nothing can relieve the soil more than a rotation of crops judiciously arranged, according to which plants of different habits and constitutions succeed each other. To reduce this to practice, we will suppose a quarter of sea-kale or asparagus, the roots of which are large, and have penetrated to a considerable depth, and which have remained in the ground for several years; and further, that they have exhausted the soil, in which they grew, of those parts which constituted their principal food, and in consequence, that they have ceased to thrive; then instead of re-planting the same piece of ground with young plants of the same kinds, let them be entirely cleared away, and the ground dug, and cropped with peas, beans, or any of the leguminous kinds, whose roots do not penetrate to any great depth, and they will derive sufficient nourishment, either different to the former kind, or such as the root of the preceding crop was too deep to absorb. In like manner, let the new crop of sea-kale, or asparagus, succeed some crop of a light description, such as any of the common annual culinary vegetables. It is a rule, from which only extraordinary circumstances can warrant a departure, never to plant a new set of perennial stock on the ground from which has just been removed a plantation of the same or a similar species, which has worn itself out. On the contrary, crops which strike deep should be succeeded by such as pierce but a little way into the ground; and crops which have occupied the ground for any length of time should be succeeded by such as are either biennial, or indeed annual.

From the general richness of garden-ground, and much manure being constantly employed in the raising of garden-crops, much less attention has perhaps been paid to the courses of cropping in the garden, than in the field. It is, however, equally necessary in one case as in the other, and the same principles are applicable to both.

A variety of circumstances, however, conspire to prevent its being so effectually accomplished in the garden as in the farm; such as the smallness of the portions of ground generally allotted to this use; the vast number of articles which are to be grown, and their great similarity and relation to each other. The following classification may be considered the most proper:

Broccoli, cabbage, cauliflower, and savoys;
 Common beans, French beans, and peas;
 Carrots, beets, and parsnips;
 Turnips, early potatoes, onions, leeks, eschalots, &c.;
 Celery, endive, lettuce, &c. &c.

It is found in practice that celery constitutes an excellent preparation for asparagus, onions, and cauliflowers.

Turnips or potatoes are a good preparation for cabbages or greens.

Broccoli or cabbages are a proper preparation for beans or peas.

Cauliflowers prepare well for onions, leeks, or turnips.

Old asparagus land affords a good preparation for potatoes or carrots.

The strawberry, currant, gooseberry, and raspberry, for the same.

Turnips give a suitable preparation for celery or endive; and peas, when well manured, are a good preparation for spinach, &c.

By properly attending to all these different points of management, crops of almost all descriptions may be put into the soil, so as to succeed with much greater certainty, and in a much more perfect manner, than is usual in the ordinary methods of putting them into the ground.

MONTHLY OPERATIONS

OF THE

KITCHEN GARDEN.

JANUARY.

CULINARY VEGETABLES AND HERBS.

SOWING CARROTS.

WHEN the weather is open and dry, about the beginning or middle of the month, prepare a warm spot of ground for a crop of early horn carrots: dig the ground deep and break it well.

This, however, is only intended for a limited crop to come in for use a little before the general one; therefore only a small piece of ground should be provided for this purpose. Choose a fine dry day to sow the seed, scattering a few radishes amongst it, and rake it in as soon as sown.

The Alteringham carrot is the best sort cultivated for general use, and is, for an early crop, preferable to the early horn, but is less generally known. Where there is the convenience of frames, and glasses to spare, a slight hot-bed may be now put up for carrots, and would be fit to remove in March, after bringing forward a crop of this esteemed vegetable. In light sandy soils, carrots sown now, or even in November, will do very well; but in heavy, clayey, wet soils, little good can be expected. In such a case, it will be necessary to make up a bed of light mould, for the purpose of getting up such crops with any degree of success.

SOWING PEAS.

Peas may now be sown on an early border, or other warm situation, if the weather be open, and the ground pretty dry. The *true* early frame, nimble taylor, and charlton, are the best for early sowing.

The early frame, if the true sort, will fruit a few days sooner than the charlton; but it grows low, and bears scantily. The charltons are not only very early, but great bearers, and excellent peas for the table; and are, therefore, equally fitted for the early crop, and forward succession crops, and inferior to few for the principal summer crops. The hotspurs are hardy and prolific, and make returns nearly as quick as the charlton, and about a fortnight before the marrowfat. These sorts, therefore, are the best for sowings made from the end of October till the middle of January, and for late crops raised between the middle of June and the beginning of August.

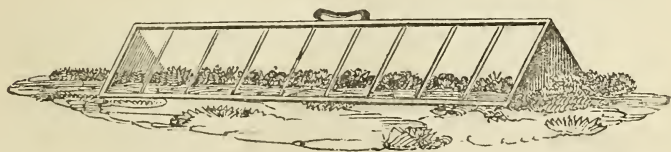
Early crops sown on a border should be always in a longitudinal direction; for if sown across the border, the one end of the rows will be fit for use, when the other end is hardly in flower; and when sown longitudinally, one row will be enough in narrow borders, which should be placed so far from the wall as not to shade the fruit-trees, still near enough to derive protection from it; the remaining part of the border, between the peas and the walk, may be cropped with early cauliflower, lettuce, salads, &c., which, being low-growing crops, will not shade the peas. In borders of the greatest breadth, the lines of peas may be sown diagonally, which will admit of their being sown at from three to four feet apart, and thus give a greater bulk of crop.

They should be sown in drills, three or three and a half feet apart, according to the sort of peas and quality of the ground, and three inches deep. Allow plenty of seed, as they will be subject to accidents at this season. Cover with the hoe or rake, but do not tread them in, as that would bind the ground too much at this season. The ground for peas, unless very poor, should not be dunged, being apt to encourage

the growth of too much straw, and, consequently, a less number of pods. Peas, as well as many other crops, are much improved by being transplanted from the bed in which the seed has been sown to another piece of ground, where they are to come to maturity. For this purpose, they are often raised in pots or boxes in forcing-houses, and gradually hardened to stand in the open borders, first by removing them from the forcing-house to a frame protected with mats, and then, according to the state of the weather, removed to the bottom of a wall, or pales, or other sheltered situation, protected by branches of spruce, or other trees; and finally transplanted, where they are to remain. The operation of transplanting is by no means tedious, and will repay the trouble by the fruit coming much earlier, and being much more prolific; or they may be sown in boxes or pots in October or November, and removed to sheltered places, as circumstances may direct, and finally planted out in rows in February or March. (*For transplanting Peas, see March.*)

For the gardens of cottagers and artizans, we would recommend the charlton and nimble taylor for their first crop, and the blue Prussian and dwarf marrowfat for their principal crops. In wet cold soils, peas at this season should be sown upon the surface of the ground, a small ridge of mould being drawn over them, which will prevent them from rotting; and the rays of heat will, consequently, penetrate better to them upon an elevated surface than upon a level one.

The crops sown in October and November, and such as are above the ground, should be protected in severe weather with the *pea-glass* case, which is a triangular frame of any con-



venient length, the sides being at right angles, and each ten or twelve inches broad. The front is glazed with small pieces of glass to transmit light, and the back is composed of a board of the above breadth; the third side or bottom is open. Upon

the top it will be convenient to have a handle, for the purpose of removing it, as circumstances may require. Glass cases of this sort ought to be in every garden, and will be extremely useful for protecting all sorts of crops, and can be procured at a very trifling expense. Some use a frame similar to the above, made by nailing together two boards lengthways at right angles. This is very useful for protecting early crops, but is not so good as the other, as it excludes the light; nevertheless, it may be used with propriety for covering the crops at night. Early crops of peas will be forwarded by rearing a bank of mould on the north side of each row, of twelve or fifteen inches in height, the rays of heat will reflect on the crop, if the bank be not placed at too great a distance from the row. We have found when the crops of peas have been sown longitudinally along the border, that hurdles, or Dutch mats, placed upright along the north side have greatly sheltered them, and often, when the crops are sown across the border, much benefit has been derived from hurdles placed on each side of the row, about twelve inches apart at bottom, and fixed together at the top. This has protected them from the frosts, at the same time that it has not shaded them too much. Cottagers, whose little gardens are often placed in favorable circumstances, might, by strict attention to the cultivation of early beans, peas, and potatoes, derive a considerable profit by having them as early as possible, and in almost every situation find a ready market for them.

PLANTING BEANS.

About the beginning of this month, if the weather be open, let some ground be made ready for a general crop of broad beans. The particular state of the weather, and the sort of soil, are always to be considered, for nothing is gained, but, on the contrary, much is lost by sowing or planting, when the ground is not in a proper state for the reception either of the seeds or roots, and it is needless almost to observe, that the ground cannot be too dry at this season.

For the larger sorts, let the rows be three feet apart from each other, and plant the beans two or three inches deep, or

sow them in drills of the same depth, and about four or five inches apart in the rows. The smaller sorts may be only two feet apart, and two or three inches in the rows.

The mazagan is the hardiest and best flavoured of the small and early sorts, and is best calculated for the earliest crops. It is said that seeds imported from Mazagan, a Portuguese settlement on the coast of Africa, where this species is indigenous, afford plants that are more early and more fruitful, than those, which spring from seeds which have been saved at home. The Lisbon is next, in point of earliness and fruitfulness; some, indeed, consider it as merely the mazagan ripened in Portugal. The dwarf-fan or cluster-bean is likewise an early variety; it rises only six or eight inches high; the branches spread out like a fan, and the pods are produced in small clusters. The Sandwich-bean has been long noted for its fruitfulness. The toker and the broad Spanish are, likewise, great bearers. Of all the large kinds, the Windsor is preferred for the table. Of this species, there are several sub-varieties, such as the broad Windsor, Taylor's Windsor, and the Kentish Windsor. The long-podded bean is a great bearer, and is very much cultivated; there are several varieties of it, such as the early, the large, and the sword long pod. If the weather at this time be open, any of the above sorts may be planted. In cold situations, beans may be now planted on warm south borders; but in early situations, they may be planted in the open quarters of the garden. For the gardens of cottagers and artizans, we would recommend the mazagan and dwarf cluster, as occupying little room, or they may be planted between the cabbage-plants, which are now in the course of planting, or which have been planted the preceding autumn. Three beans may be sown between every two cabbages in the same line. If sown on an early border, sow in longitudinal rows, and not across it, for reasons given in the preceding article. Crops sown this month will, in most cases, be as forward in fruit, as those sown in November. If the ground be in good heart, it need not be dunged for this crop. Beans thrive best as a full crop in strong land, but of course, will be earlier in light soil. Be careful to entrap mice, which at this season are apt to commit depredations upon this crop.

The crops sown in October or November should now have the ground carefully stirred about them, in dry weather. If the weather be very severe, cover occasionally with the pea hand-glass recommended in the preceding article; but if that be not the case, they will be better without it.

PLANTING GARLIC AND ROCAMBOLE.

Garlic may still be planted, but November is the most seasonable month for that purpose. In planting garlic, divide the roots into parts. It will grow in any ordinary garden-ground, but best in light rich soil. A small quantity will be sufficient for most families.

Rocambole may now also be planted, in every respect as garlic; but if the soil be wet and heavy, it will be better to defer them both till next month

SOWING PARSLEY.

Parsley may be sown about the latter end of the month, in rows, as an edging to an alley, or walk. It will thrive in any ordinary soil, or situation; let the drills be half an inch deep, and if sown in an open space, let them be twelve or fifteen inches asunder. The curled sort is the best, and less likely to be mistaken for Hemlock (*Conium macculatum*), which bears some resemblance to the common plain sort, and is a deadly poison; many lamentable instances are recorded of the fatal effects of people using hemlock by mistaking it for parsley. This seed remains longer in the ground than that of any other culinary vegetable, before the process of vegetation commences. With the knowledge of this fact, the gardener should take it into his calculation at the time of sowing his crops, for without we know, with some degree of certainty, the length of time that will elapse from the sowing or planting, until the crop be fit to gather, we shall be apt to run wide of the mark, in providing a regular supply, or answering the demand of a particular season. To the young gardener, we cannot sufficiently urge the necessity of his keeping a regular journal, or day-book, not only of every sort of seed sown or root

planted, but also of every operation began or finished connected with his profession. By a careful attention to this rule, he will soon become acquainted with the nature, duration, and use of every cultivated vegetable. Nor let him deem this trouble too great, for he will not be aware of the importance of such a journal, until he takes the charge of a garden on his own account; and then, and not till then, will he find, that he is not so perfect, as he imagines himself to be. The utility of such journals has been acknowledged by the most eminent men in the profession, particularly when accompanied by notes made in their juvenile years.

HAMBURG PARSLEY.

The roots of Hamburg parsley are used in soups, and may be sown in drills a foot apart, about the latter end of the month. As the roots penetrate to a considerable depth, the ground should be either trenched or deeply dug, in order to obtain the roots of a considerable size. This root is not in very great demand in families, therefore a small quantity should only be sown.

PLANTING ESCHALOTS.

Eschalots may be planted about the middle or end of the month, if they have not been planted in November, which is the best season for that operation. They require good rich light soil, and an open situation. Choose a piece of ground which has been dunged for the preceding crop, as they are apt to canker, and be infested with maggots, if planted in fresh dung. They may be planted in rows one foot apart, and the roots nine inches distant in the lines. If necessary to manure the ground, we have found the dung of pigeons or poultry the best, and least liable to breed grubs. Autumnal planting is, however, the best preventive.

SOWING SPINACH.

A little round spinach seed may be now sown on a small piece of ground, to be gathered soon in spring, as a substitute

for the autumnal-sown crops. If the weather be favorable, sow a little at the beginning, and also at the end of the month. Spinach may be sown in drills between the crops of early peas, beans, or such like crops.

PLANTING OUT CABBAGE-PLANTS.

When the weather is open, lay out some ground for cabbage-plants: let some rotten dung be thrown on the ground, which should be well buried in, one spade deep, and properly mixed with the earth in the bottom of the trenches.

About the latter part of the month, if the weather be mild, and the plants strong, they may be removed, observing to plant them about three feet asunder every way, for the larger growing sorts; those of less size may be planted much thicker.

The sugar-loaf and early York cabbage, are the best to plant at this season; but any of the larger sorts may also be planted out at the same time.

Fill up the places of the plants that have died in the former plantations, or which have been destroyed by the weather or vermin.

On the same ground, where cabbages are planted in the spring, a thin crop of round-leaved spinach may be sown, which will be fit to gather in April, or the beginning of May. In this case, the seed must be sown broad-cast, but thinly, and raked in, choosing a dry day for the operation.

TRANSPLANT CABBAGES, &c. FOR SEED.

Transplant cabbages and savoys, &c. for seed: this work should be done generally in November or December; but where it was omitted, it may still be done in the beginning of this month.

The saving of culinary seeds is not the province of those, who have the direction of the gardens of the nobility and gentry, but to a very limited extent. It forms an extensive branch of the interest of the commercial gardener and seed-grower. The growing of seeds within the limits of an ordinary garden is, with few exceptions, very unprofitable; but where the gar-

dener is in possession of any new, improved, rare, or valuable vegetable, it is of the utmost importance to save the seed, not only for his own future supply, but for the purpose of distributing it amongst his friends. Many seeds become spurious, in consequence of their flowers being impregnated by the fertilizing pollen of other plants, nearly allied to them, and none more so than the *brassica* family. The seed-growers in many countries are so well convinced of this circumstance, that a particular individual grows only one sort of seed; whilst another grows a different sort, at a distance of several miles. Bees, the force of winds, and other causes, all tend to this hebridizing of many families, particularly of cruciferous plants. In the same garden, they cannot possibly be preserved genuine, or free from contamination, if more than one sort of a genus be cultivated for seed. Peas and beans are less liable to this objection, but the produce which they yield will not be repaid by the ground, which they occupy; and in all cases, unless for particular purposes, the trifling expense of their purchase from the fair dealer will be more than expended in their production. Seeds sown on the same ground for a series of crops, degenerate, and ultimately become unfit for use.

For the purpose of saving seed, let some of the largest and best full-grown cabbages, &c. be taken up in a mild dry day, and divested of the large outer leaves. If they appear wet, place them with their heads downward a day or two, in order to drain off any moisture before they are planted, which will prevent their rotting; or, in default of full cabbages, use cabbage-stalks, furnished with good full heads of strong sprouts, as they will answer the same purpose, both in regard to the goodness of the seed and its produce.

Let a dry open compartment, exposed to the full sun and free air, be chosen for planting them, and the readiest method is to plant them in trenches, as the ground is dug: the plants should be allowed to stand two or three feet distant from each other.

Dig the ground a full spade deep, and keep the trenches clear and wide. When the digging is advanced two feet from the end, then with the spade cut the edge of the trench even on the side that is dug, and inclining rather perpendicularly

to the bottom; then set the cabbages in the trench, in a similar position, close to the ground which has been dug, with the bottom of their heads a little within the surface: and having planted one row, proceed again with the digging, laying the ground against their stalks and roots, and round the bottom of each head, continuing with the digging till advanced two or three feet from the row of plants; then prepare the trench as before, and so proceed till the whole be planted. They will shoot up into flower-stalks, and will ripen their seed in the following August.

CAULIFLOWERS.

Examine the frames in which young cauliflower plants have stood the winter, and of those that are withered, or damaged, let such leaves be picked off, allowing no weeds to grow among them. If the surface of the ground can conveniently be moved a little, it will be of great use to the plants.

In mild weather, let the plants have plenty of free air every day, by tilting the glasses, or by taking them entirely off, when the weather will admit: keeping them close down every night, and never opening them in frosty weather.

In very sharp weather, cover the glasses every night, and, if necessary, in the day-time, with mats, straw, or fern; also lay some litter round the edges of the frame, which will be of great service in preventing the frost from penetrating at the sides.

Cauliflowers under bell or hand-glasses should also have air every fine and mild day, by tilting the glasses on the warmest side; in severe weather, keep them close; in hard frosts, lay some long litter round each glass, which will prove of great shelter to the plants: but in mild fine weather, the glasses may be taken off every day, for a few hours; but they must be kept closely shut every night.

Look carefully once a week or oftener, if mild weather, over the cauliflower plants, as slugs will destroy many of them, the best way is to pick them carefully off with the hand. In severe weather, mice and rats will be apt to destroy them; recourse must then be had to poison and traps.

Cauliflower plants pricked into pots, stand the winter well, as by that means they may be removed from one place to another, as circumstances may require; and, being turned out with balls, when planted, where they are to remain, will greatly promote their future growth.

The following method of obtaining a crop of early cauliflower, a week or ten days sooner than those treated in the usual way, is recommended by an anonymous correspondent of the *Gardeners' Magazine*.

From a seed-bed which has been sown two or three days *after* rather than *before* the customary period, select a score or two of healthy plants; pot them singly into the smallest-sized garden-pots, in rich loamy compost; water and plunge them in a cold frame, shading for a short time, till they have taken root. Afterwards give air daily, drawing on the lights at night, and defending from severe frost with a mat or two; water frequently with tepid manured water, and keep clear from decayed leaves and weeds. Examine the state of the roots from time to time, and, as they become in the least degree matted, immediately shift into forty-eight-sized pots, with the before-mentioned compost, and replace them carefully in the same frame, attending to them as before. When the roots have nearly filled these last pots, shift into thirty-twos, and in due time, they will ultimately require twenty-fours, or if they have grown rapidly, even eighteens. After being firmly established in these, they may be removed into a vinery, peach, or other forcing-house, there to remain till the end of March or beginning of April, when they may be turned out into the open air, between the asparagus beds, or any other warm and sheltered spot. They will require to be put in pretty deep, and protected by hand-glasses, or at least by boughs of trees, that they may not suffer from the sudden transition of weather or inclement skies. It is hardly necessary to add, that the whole success of this mode of culture depends entirely on the plants receiving no check in any stage of their growth, either from want of timely re-potting, water, air, or sufficient protection from frost. While in the house, if not supplied with water in pans, they are very liable to button, and thereby wholly defeat the end in view.

CAPE-BROCCOLI.

Cape Broccoli, managed exactly according to the directions given for cauliflower, will come into use rather before that vegetable, and afford a variety for the table, at a season when vegetables are much in request. This method will prolong the season of the broccoli tribe during the greatest part of the year.

BROCCOLI.

If the crops of broccoli have been properly moulded up, according to the directions given in November, they can still be further protected from the effects of frost, by laying some bean-haulm, or other litter on the ground, amongst their stems, and then sticking the whole plot full of old pea-stakes, or other branches, in imitation of a natural coppice. The shade afforded by this simple process will greatly counteract the effects of sunshine succeeding severe frosts, which at this season, and in February particularly, are so hurtful to all culinary vegetables.

ARTICHOKES.

Artichokes, if not earthed up, or covered as directed in November, should not be neglected any longer, except the severity of the frost prevents the landing up; in which case, as these plants are liable to suffer by rigorous frosts, it is advisable to give some temporary protection, first clearing away the decayed and large old leaves, then applying a thick covering of long, dry, strawy dung, or mulchy litter, closely about each plant; but if open weather, it would be most expedient to earth them up; observing, preparatory to this operation, to cut away all the large and decayed old leaves nearest to the ground, then to dig between, and earth up the plants, as in November and December.

After they are earthed up, if the frost should prove very severe, it will be proper to lay light dry mulch or long litter over the rows: if the plants be of the true globe sort, too great

care cannot be taken to preserve them; for sometimes a severe winter makes great havoc among them; and, in spring, young sets to recruit the plantations are often very scarce.

EARTH UP CELERY.

Take the advantage of a dry day before the setting in of frost, to earth up celery that requires it. But this had better be deferred, if the plants be not quite dry, for if earthed up, when wet, they become cankered, and many will consequently be unfit for use. The earthing up of this crop, if properly done at previously stated intervals, and never allowing them to shoot too far without mould, will render any further earthing up (that is, for full grown crops) unnecessary, as they will blanch when taken into the shed, or cellar, and buried among sand to within a few inches of their whole length. But for successional crops, let the earth be well broken, and laid up to the plants lightly, that they may not be crushed down nor bruised, raising the earth very near to the top of the plants; for if severe frost sets in, it would destroy, or at least greatly damage such parts as are above ground, and would occasion a great part of the interior to decay or rot downward.

As these plants are required for use every day, if the ground be frozen hard, they cannot be easily taken up: therefore, at the approach of severe weather, either cover some of the rows with dry long litter, which will prevent the ground from being frozen, and will also protect the plants; or, a certain number may be taken up in a dry day, for the service of the family, carried into a sheltered place, and there laid in dry earth, or sand till they be wanted for use.

MUSHROOMS.

Mushroom-beds should be carefully attended to at this season. They should have sufficient covering to defend them effectually from the frost, rain, or snow; and such covering should not be less than twelve inches thick; should heavy rain or snow have penetrated quite through the covering, it must

be removed immediately, or the spawn will be in danger of perishing. Replace it with a good covering of clean and dry wheaten or other straw; and in order to defend the bed more effectually from wet and cold, it would be advisable to spread some large garden-mats or canvas cloths over the straw, which will greatly preserve the beds. The cheapest and most effectual covering for mushroom-beds is Dutch reed-mats, which are capable of throwing off the rain more effectually than any other material of equal price. Their lightness, and the facility with which they are rolled up, give them a decided advantage, independently of their durability, which is much greater than that of garden-mats or straw, and much less troublesome. They can be procured from Holland very cheap, and are to be had of Mr. M'Kay, of the Clapton nurseries, who imports them annually from that country. The Dutch gardeners make use of them for their general covering; and for the purpose of covering frames, pits, or low houses, they are far superior to any other in use.

Mushroom-beds may now be made: they will afford a full crop in spring and beginning of summer, though probably not so successful as the autumnal-made beds. See *September*, for the method of making and spawning the beds, &c.

SEA-KALE.

For the general management of sea-kale, see *November*. The practice there recommended is equally applicable to the present month.

ONIONS.

In light soils, the months of August, January, or the beginning of February, are the proper seasons for sowing onions, with the view of obtaining a plentiful crop; but if the soil be heavy, March, or early in April, is to be preferred. If the ground be not in a dry state, onions should not be sown this month; nevertheless, the opportunity should not be lost, whenever the ground will admit of it.

LETTUCE.

If the weather be mild and dry towards the middle or the latter end of the month, lettuce may be sown. A rich light soil, and an early warm spot are to be chosen. The brown Dutch, hardy green, white cos, and green cos, are the kinds most proper for this sowing, and for the purpose of procuring plants for transplanting in March. Let the seed be sown rather thickly; let it be lightly covered, and raked in smoothly and neatly: the seeds must not be trodden nor beaten in.

It will be necessary, in order to ensure a supply of spring lettuce, to sow a small quantity of the above sorts on a slight hot-bed towards the end of the month, and when sufficiently stout, should be hardened by exposing them to the air by degrees, until they be strong enough to stand unprotected: a box with three lights, if properly managed, will afford a supply that will be sufficient for an ordinary family. It is not advisable to sow any thing along with them, as it would tend to draw them up too slender.

Care of the various Sorts of LETTUCES sown in Autumn.

If the lettuce-plants be in frames, or under hoop-arches defended with mats, let them enjoy the open air, whenever the weather is mild and dry.

But in very wet weather, and when sharp cutting winds prevail, keep the glasses or mats over them, observing, however, to raise them two or three inches in mild days, to admit air to the plants; for if they be kept too close, they will be drawn up weak, and attain to little perfection; let the glasses, however, be closely shut every cold night. In severe frosty weather, keep them close night and day, and cover the glasses with mats, or straw, &c. Where any cos-lettuces are pricked out in a south border, closely under the wall, it would be advisable in hard frost, to cover them also; pick off all decayed leaves when any appear; keep the plants clear from weeds; destroy slugs; and in mild weather stir the surface of the earth between, which will much invigorate the plants.

SOWING SMALL SALADING.

Cresses and mustard may now be sown on some sheltered dry border at the bottom of a wall or pales. But where there is the convenience of a common garden-frame, it will be better to sow either under it or hand-glasses.

The most certain and least troublesome method to keep up a supply of small salading at this season, is to sow the seed in flat boxes, or pans, in decomposed or rotten tan, or any other light vegetable matter, and place them either in the cucumber pits or frames, or in the hot-houses over the flues, or in any other place not too much shaded, and unoccupied with other plants; attending to sow every second or third day, according to the consumption. The same mould will produce a number of crops without being renewed.

MINT.

At this season mint is in demand for salads and sauce, &c.; let a few pots be placed in any of the forcing-houses now at work.

ASPARAGUS.

For forcing of, see *Forcing Garden*.

FRENCH BEANS.

For forcing of, see *Forcing Garden*.

RADISHES.

About the beginning, or any time this month, when the weather is open and mild, sow some short-topped radishes to come in as an early crop on a warm border, sloping towards the sun, and under a wall or other fence, and towards the middle or latter end of the month sow a crop of salmon radishes to succeed the short-topped.

Never mix the seed of both sorts, but let each sort be sown separately; for the short-topped will come into use sooner by

a week or ten days than the salmon radish, even if both be sown at the same time; besides, the latter kind runs more to leaf than the former.

The best method is, to sow a little of the short-topped kind at least twice this month, in the beginning, and middle; and sow some more about the latter end likewise, on the same situation.

A little carrot-seed may be mixed and sown with the radish-seed, for if the radishes should fail, the carrots may still succeed; and, if both succeed, a double advantage will be obtained; for when the radishes are pulled up, a crop of carrots still remains, which will come in at a very early season: or instead of the carrots, a small quantity of round-leaved spinach and some lettuce may be sown, and when the radishes come off, these will come in. This is the common practice of the London gardeners, and is generally successful.

Sow the radish-seeds tolerably thick at this season; for as soon as the plants begin to appear, the weather, if it should prove severe, will cut off some, and the birds also being apt to attack them greedily, will destroy the rest; sow the seed evenly on the surface, and either rake it in, or cover it with fine earth from the alleys, about half an inch deep; observing, that if the weather should set in frosty after the seed be sown, it will be of great advantage to spread some dry long litter over the beds two or three inches thick, which will keep out the frost, and forward the vegetation of the seed.

When the plants begin to appear, proper means must be used to protect them from the frost and birds, by spreading straw, fern, or thin mats over the surface, there to continue till the plants have attained a proper size: and if the weather prove severe after the plants appear, cover them also occasionally with straw, &c., which will be a great protection from the injury of the frost; and if carefully laid on and taken off, it will neither break nor hurt them, using a fork in laying it on, and a light wooden rake to draw it off into the alleys, where it must be suffered to lie ready to throw over the plants every night, and even in the day, as occasion may require; the covering should be applied every night, when there is any likelihood of frost, but must be kept off in fine weather. The covering of

early radishes should be continued occasionally, until the rough leaves of the plants have appeared. This is the common practice of gardeners, who thereby have them ready to draw for market in March.

PLANTING POTATOE-ONIONS.

If the potatoe-onions have not been planted in December, they may be now planted if the weather be open. For which, see *December*.

WORK TO BE DONE IN THE CULINARY GARDEN.

All vacant pieces of ground should at this time be either trenched or deeply dug, according to the purposes for which they may be intended; but this should not be done, if the ground be wet, or if snow be lying on it. The rougher the surface can be made, whether the ground be trenched, or dug, the better. If dug, it is better to form it into ridges of any convenient size, so that the frost may act upon as large a surface as possible. The gravel-walks of the culinary garden should be dug up, and the gravel left in a neat ridge in the middle of the walk, leaving the sides as smooth as possible for the convenience of wheeling upon: this will destroy the roots of the weeds; and if the gravel be again laid down in March, the walks will have a neat and clean appearance for the season. The several heaps of composts, dung, &c., should in frosty weather be turned over, and well mixed, to render them fit for use when they may be wanted in the spring or summer.

If there be any hedges of any kind, evergreens excepted, in the kitchen-garden, or surrounding it, they should be now cut, so as to leave as little to do in the succeeding months as possible, that can, with propriety, be done in this. Pea-stakes should be drawn to the garden, and made and neatly tied up in bundles; it will save time when they may be wanted in spring. The outer fences of the garden, if hedges or pales, should be examined now, and put in repair, if necessary. In bad weather, labels of all sorts ought to be made, and numbered

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and laid up so as to be conveniently at hand when wanted. In the gardens of cottagers, &c., the ground should be turned up, and the fences repaired; any manure that can be collected by the road-side, or other places, should be now carefully attended to, and if the cottager be unemployed, his time cannot be better spent, than in wheeling into his garden any old banks by the sides of roads, or other waste places, where permission can be obtained. It will much improve his soil if it be laid on the ground, and left to pulverize till the following month or March, when it should be dug into the ground along with any other manure, which he may be able to procure from his pigs, or the ashes of his fire.

Where the nature of the ground requires draining, this is the season to have it done; if that very necessary process has been neglected in the formation of the garden, no time should be lost; and in making the drains, it may be observed, that the nearer they are to the surface, the better, in order that they may be filled with stones or other materials. A regular plan of all drains should be kept in the gardener's room, and all alterations or additions carefully and accurately inserted. This will prevent confusion at any time, that it may be deemed necessary to examine or repair them. In bad weather, the garden-implements should be examined, and such as require it, put in proper repair, and where any are wanting, let them be sought after, and replaced. However trifling this may appear, it will save much time and expense, at the time when they are wanted for use.

We would here recommend, as a rule adopted by ourselves during the whole course of our practice, to give an inventory of all seeds, tools, &c., connected with the culinary garden, into the hands of the kitchen-garden foreman, or under-gardener, and that he give to each of his men the proper tools for the particular employment allotted to him, and to make every man responsible for them. Each gardener should have a full set of tools; he should consider them his property, while he is in the employment, and when one is broken or worn out, by reporting it to his foreman, he must be supplied with another.

A tool-house is an appendage attached to almost every garden, from the nobleman's to the tradesman's villa; but it is,

generally speaking, a name only, and more often filled with useless lumber, than implements of horticulture. Nothing shows the want of regularity and system, and consequently bad management, more than to see a spade lying in one place, a rake in another, and a wheelbarrow in a third. We would recommend that every operative be compelled, on quitting his work, to carry such of his tools, as he may have been using into the tool-house, where they should be properly cleaned, and either placed upright or hung upon nails, according to their respective kinds; and this house should be regularly locked by the foreman, and opened by him in the morning. A system of regularity of this sort will prevent altercation, and in a short time will cease to be unpleasant to the men; they will perform it as mechanically, as they do most of their other duties. At this season, the store-house should be examined; all bulbs, onions, and roots carefully looked over, and those in a state of decay removed to prevent contamination. Every attention should be paid to such things as are liable to be injured by frost, in order that they may be protected in time, for if deferred too long, an irreparable loss may be the consequence. Where there is much wheeling to do, this is the proper season to perform it, as during frost, the men will do more at this work, than they can accomplish, when the walks and ground are soft. Leaves should be collected in the woods for the purpose of undergoing fermentation, either for accelerating crops or fruits; or if not wanted for such purposes, they should be gathered in heaps to rot into vegetable mould, which will always be useful in the kitchen-garden, and in the other gardens it is actually indispensable.

FEBRUARY.

SOWING PEAS.

A full crop of charltons may be sown about the beginning, and of marrowfats and other larger sorts towards the end of the month, in the open quarters of the garden. It frequently happens that the fruit of a sowing made the beginning of this month, is not a week later than that of a crop sown in November, and often surpasses all that have stood the winter in forward returns, as well as in quantity. For small families, tradespeople, and cottagers, the middle of February is the best time for sowing to obtain an early profitable crop; and, in many situations, the ingenious gardener is unable to bring peas to table sooner by any means which he can adopt in the open air, than from the crop sown the beginning of February. From the middle of this month, make successive sowings every three weeks during the months of March, April, and May; and twice in each of the months of June, July, and August; reducing the quantity each time from the end of June till the middle of August. The crops of the later sowings will depend on the state of the weather during the following autumn, and in general, they are small and scanty. For the early and dwarf crops sown in the beginning of the month, from three to four feet will be plenty between the rows, and three inches deep. If the ground be wet, do not tread the seeds in; but if perfectly dry, a slight treading will prevent them from being displaced in the operation of covering. Sow peas of sorts in pots or flat boxes, according to the plan recommended for beans; if for extensive crops, sow on a slight hot-bed. This has been practised by Mr. Bishop, an intelligent and experienced gardener, and is the most rational plan of transplanting peas ever practiced.

PLANTING POTATOES.

Potatoes may be planted about the middle, or towards the latter end of this month, if the weather be mild.

These roots are propagated by planting them, either whole or in pieces. The better practice is to procure tolerably large roots, and to cut each into two, three, or more pieces, observing that every piece be furnished with one or two buds, or eyes.

They are to be set in rows, a foot and a half or two feet asunder, a foot apart from each other in the row, and about five or six inches in the ground.

Potatoes may be planted progressively as the earth is dug or ploughed, by placing them in the trenches or furrows, allowing them the distance above-mentioned; or they may be planted with a dibble, after the ground is dug; but for the particular manner of planting these roots, see the *Culinary Garden* for *April*.

TRANSPLANTING CABBAGES.

The early sugar-loaf cabbage, and other cabbage-plants, should be transplanted this month, where they are intended to remain.

Where the plants are pretty strong, they may, in mild open weather, be planted out the beginning of the month; but if they be weakly, or much hurt by the frost, they should not be planted out before the end of this month, or the beginning of the next.

Choose a piece of good ground for these plants, in an open situation, and let some rotten dung be dug in. Set the plants in rows, two feet and a half asunder, and allow the same space between the rows.

SOWING CABBAGES.

Sow cabbages about the middle or latter end of the month, for summer and autumn use. These will be fit to cut in July, August, and September, &c.

But if the winter has destroyed many of the plants, which were sown the preceding August, it will be proper to sow some of the early seed as soon in this month as the weather will permit; and if a few be forwarded by sowing them in a

slight hot-bed, it will be a great advantage. For the earliest crops of cabbages, allot some of the small early dwarf, early dwarf York, East Ham, and sugar-loaf, for cabbaging in April, May, and June: secondly, raise more considerable quantities of the middle-sized kinds, particularly the large York, and large sugar-loaf, or the Battersea, Penton, Imperial, Antwerp, Russian, &c. for general summer crops; choose the larger latter sorts, for succession during the summer and autumn. The large hollow sugar-loaf, oblong hollow, long-sided hollow, and large round winter (white) are excellent for full cabbaging in August, September, and October, till Christmas: any of the middle-sized varieties may be sown for latter succession crops in summer and autumn, to cut when young. The large round winter cabbage, great drum, Scotch, and American kinds, are more adapted for field-culture, to feed cattle in winter, &c.

Sow also some red cabbages for next winter's supply.

Cabbages and savoys for seed may be planted this month, if not done before. Take up the plants in a dry day, clear off all the large leaves, and plant them two feet asunder each way, according to the method explained last month, placing them so deep, that no part but the head may appear above ground.

SOWING SAVOYS.

Savoy seed may be sown, for the first crop, about the middle or latter end of this month. Those savoys which are now sown will be ready in September, and they will be finely cabbaged by October, and continue in good perfection all November and December, &c.

EARTHING UP CABBAGES.

Attention must now be paid to the cabbages, which were planted out in the October of the preceding year; if the weather be dry, the ground should be well stirred about their roots with a hoe, drawing up at the same time some mould about their stems. This will invigorate the plants, and tend to promote their growth.

MANAGEMENT OF CAULIFLOWERS.

Cauliflower-plants in frames should have plenty of air every mild day, by entirely removing the glasses.

Towards the end of the month transplant some of the strongest plants into the place, where they are intended to remain. Plant them in a rich spot of ground, allowing them thirty inches, or a yard distant each way. It will be necessary to choose a sheltered warm spot for this crop, and also to shelter them occasionally.

Cauliflowers under hand or bell-glasses, should also be thinned out, where there is a superfluity; that is, if there be more than four plants under each glass, all above that number should be removed. Observe to draw up the weakest, and let four of the strongest remain under each glass, and raise some earth up round their stems at the same time. The plants which are taken up should be transplanted to another sheltered spot of ground, allowing them sufficient room to come to perfection.

In removing cauliflowers, it is common with those gardeners, who are obliged to make the most of their ground, to sow, on the same spot, a crop of spinach and radishes, which turns out to good account, without in the least injuring the growth of the cauliflower-plants; for by the time they begin to advance towards perfection, the radishes and spinach will be all taken up for use.

Sow cauliflower-seed the first week of this month, to raise some plants to succeed the early crop; but in order to bring the plants up early, and to forward them twelve days or a fortnight in their growth, it will be well to sow them in a moderate hot-bed.

Make the bed about twenty inches or two feet thick of dung, on which put a frame; then lay four or five inches in depth of rich earth over the bed.

Sow the seed on the surface, cover it with light rich earth, about a quarter of an inch thick, and then set the glass on.

As soon as the plants appear, let them have air every day, by tilting the glass a considerable height; and in mild weather, the lights may be taken quite off in the day-time, for they

must not be kept too close, as that would cause them to grow up weak.

But where there is not the convenience of a frame for the aforementioned bed, cover it at nights, and in bad weather, with mats, placing hoops, long sticks, or poles, arch-ways across, and over these lay the mats, or Dutch reed-mats, as already recommended.

Sprinkle them with water occasionally, if moderate showers of rain do not happen about this time, but not so as to create too much damp.

PLANTING BEANS.

Any of the beans recommended last month may be now sown, and the sooner in the month the better. In this, and in all other cases connected with planting and sowing, the exact time must be regulated by the state of the weather, and the nature of the soil. In light sandy soils, sowing and planting should be done as early as possible; and in wet strong soils, the seeds are better in the seed-room than in the ground, when it is not in a proper state to receive them. A few of the early sorts may be planted in the beginning of the month, and the larger growing sorts towards the end. As the plantings done this month will be for principal summer crops, the quantity planted should be in proportion to the demand. The long pod and Windsor sorts are to be preferred for the last crops planted this month. Plant in lines three feet asunder, and four or five inches apart in the line. For the gardens of cottagers and artizans, the middle-sized sorts, such as the long-pods, broad Spanish, and white-blossomed beans, are to be preferred, as they are great bearers, and occupy less room than some of the other sorts in cultivation. About the beginning of this month, plant beans in pots or flat boxes, and place them in any of the hot-houses at work, or in a hot-bed frame. When they appear above the surface, remove them to a colder place, so as to harden them by degrees to fit them for transplantation next month. Beans are so much improved by being transplanted, that the practice ought to be more generally adopted than it is. In sowing beans for transplanting, observe

to place small pieces of turf, three or four inches broad and six or eight inches long, under the mould in which they are sown; for by this means, they will transplant with better balls, and the roots will be less liable to be injured.

EARTHING UP BEANS.

Take advantage of a dry day, to stir up the surface with a rake among beans that are now above ground; and if sufficiently above ground, draw a little earth to their stems.

SOWING CELERY.

About the middle or end of the month, prepare a small bed of light rich earth in a warm sheltered situation, in which to sow some celery-seed for an early crop.

Break the mould very fine, as the seed is small, and rake the surface even; sow the seed, but not too thick, and cover it with light rich mould, about a quarter of an inch deep.

Those who wish to have the plants come in early, should sow the seed in a slight hot-bed, or in flat boxes in any of the forcing-houses that may be at work, to be afterwards hardened by degrees, by removing them from one colder department into another, until they be fit to stand in the open air, when they may be pricked out into a warm border, or upon a slight hot-bed, to remain until finally planted out.

The plants raised from this sowing come into use about the middle of July.

There should not be many of these early sown plants pricked out, but only just a sufficiency to come in before the general crop; for they will soon pipe and run to seed.

SOWING CARROTS.

About the middle or end of the month, carrot may be sown for an early crop, on a light border or other sheltered spot; but the beginning of April is soon enough to sow the principal crop. The seed may either be sown broad-cast, or in drills, but the latter is to be preferred. If broad-cast, strew

as equally as possible, cover lightly, and rake all smooth. For the more regular division and separation of this seed, let it be well rubbed between the hands, mixing it up with dry mould, or sharp sand. Crops of such seeds as carrot, and some others, will at this early season be much benefited, if the drills in which they are to be sown, be half filled with light vegetable mould, on which the seed must be sprinkled, and then covered with the same sort of mould. In strong wet soils, this should be particularly attended to, as seeds will vegetate quicker, and become established much sooner, than if sown in the natural ground. If in drills, let them be shallow; half an inch in depth is enough; and ten or twelve inches apart. Cover with the hoe or rake, and dress the surface fine. See *April*.

The Alteringham is the fittest for this sowing, a little early horn may also be sown, but the other is equally early, and a much better carrot.

PLANTING GARLIC AND ROCAMBOLE.

If these were not planted in January, the present is a good time. Dig the ground deep, and break it fine, if of a tenacious quality. Neither of these roots is much used, so that a small piece of ground will afford an ample supply for an ordinary family.

PREPARE GROUND FOR SOWING ONIONS.

Take advantage of a dry day, provided the ground be not naturally wet, nor rendered so by continued rain, to point over the ground, which has been manured and rough dug in autumn, which by this time will be well pulverized by the continued action of frost and rains upon it. Point it over six inches deep, and break it well with the spade. If no ground have been purposely prepared in the above manner, make choice of a rich piece, which has been properly manured for the preceding crop; that which has been occupied by celery, will answer the purpose well; dig it slightly, and break the clods as finely as possible. If there should not be a piece of ground in sufficient good heart to spare, make choice of

another; and if it be deemed necessary to manure it, prefer a compost of decomposed stable-dung, cow-dung, and earth, for any compost is preferable to simple dung, as being less likely to breed maggots.

The latter end of this month may be considered as the proper time to sow a full crop of onions, if the land be of a middling texture; but if it be wet and heavy, we would recommend to defer the sowing till the subsequent month, or the first week in April. Any of the following sorts may be sown at this time, the Strasburg, Deptford, Spanish, Portugal, the silver-skinned, red-skinned, &c.; the two former, however, which are considered by some to be the same species, produce the most abundant crops, and are allowed to be the best keepers.

Sow any of the above-mentioned kinds in four feet beds, thinly, and cover to the thickness of a quarter of an inch; or in shallow drills, nine or ten inches apart, also thinly. The drill system is to be preferred, both for neatness and utility, as by this method, the crop can be hoed, which will destroy the weeds, and by occasionally stirring the surface, greatly promote the growth of the plants, particularly when the bulbs are swelling. A little lettuce or celery-seed may be thinly sown along with them, but this must be done sparingly.

Rake all smooth, but in neither case must the seed be trodden in, unless the ground be very dry indeed. Onions intended for pickling should be sown in poor ground, or under the shade of trees, to keep them small. The Strasburg is generally sown for principal crops, and next, the Deptford; the small silver-skinned and two-bladed are the best for pickling. The Portugal and Spanish yield large crops for early use, and should, in cold situations, be sown in March. The Strasburg is hardy, and stands the winter, if sown in September, or the latter end of August.

WINTER CROP OF ONIONS.

The crop of winter onions, or that which has been sown in the end of August or beginning of September, should now be gone over about the end of the month, and cleared from weeds;

if needful, they should be regularly thinned. Let the surface be well stirred up among the plants. If green onions be in demand for the use of the kitchen, they need not be much thinned at this time, but rather delay the final thinning till April or May. (*See those months.*)

SOWING PARSLEY.

Parsley may again be sown for successional crops; prefer always the curled sort, as being more luxuriant and handsome for garnishing, and is not likely to be mistaken for those poisonous plants, fool's parsley, *Aethusa Cynapium*, and common hemlock, *Conium maculatum*; both are common weeds growing in gardens, and have often been mistaken for parsley. The leaves of fool's parsley may be easily distinguished from the genuine parsley, being of a darker green, of a different shape, and instead of the smell peculiar to parsley, have, when bruised, a disagreeable odor. When the flower-stem of the fool's parsley appears, the plant is at once distinguished, by what is vulgarly called its beard, consisting of three long pendant leaflets of the *involucrum*.

HAMBURG PARSLEY.

Hamburg parsley may be sown in drills one foot asunder, and two inches deep. It will thrive well in any ordinary garden soil, which is of sufficient depth, and not over rich.

BEET.

A small quantity of red beet may be sown to come in early for salads, and a little of the green and white sorts for their leaves in soups and stews. But defer the principal crops of beet till April; if sown sooner it is apt to run to seed, or at least to become hard and stringy.

CHIVES.

Chives are used by many, both in the kitchen and in salads, and are a substitute for spring-onions. They will grow in

almost any soil, and are easily propagated by sets. They may be planted in rows, eight or nine inches asunder, and four or five in the row. Any time in this month, or in March, will be proper for planting.

SOWING SPINACH.

At the beginning of this month, spinach of the round sort may be sown on an open spot, and also for successional crops at the end of the month. The winter crops must now be hoed and cleared, and although entirely free from weeds, yet the earth should be stirred about the plants. If these crops have been sown broad-cast, they should be thinned out to eight or nine inches square, and if in drills, to three or four inches between the plants. Spinach, managed according to this system, will, if in rich land, produce a fine large leaf, and a much more abundant crop than if left unthinned, which is too frequently the case. Fine weather must be chosen for this purpose, and the surface must be well loosened among the plants, particularly if the soil be of a stiff nature, and the ground have been much affected by heavy rains, or trodden upon during winter.

Spinach requires a richer soil than almost any other culinary vegetable to bring it to perfection, as it has to yield frequent gatherings or cuttings, and therefore requires a repeated development of parts, which cannot be expected without an abundance of food. The finest crops of this vegetable may be expected from ground glutted with manure, so far as the attainment of bulk of vegetable matter is concerned.

LEEKs.

Leeks should be sown in a bed of rich land, and moderately thick, as they must be afterwards transplanted.

MUSHROOMS.

Be careful that the mushroom-beds be well protected from heavy rains and frost; either of which would destroy the spawn.

The covering of straw should not be less, over every part of the bed, than twelve or fifteen inches thick. If the wet have at any time penetrated through the covering, let it be removed, and fresh dry covering put on. If covered with Dutch reed-mats, rain will seldom injure the beds, as they are capable of throwing off the water much better than garden-mats.

PARSNIP.

Prepare a piece of ground by trenching eighteen inches or two feet deep, on which the parsnip-seed is to be sown. The parsnip is a native of the chalky downs of Kent and Hampshire, the roots of which penetrate to a great depth in the almost solid chalk. In garden-culture, it will be found to attain its greatest perfection in ground rendered sufficiently deep by trenching, and manured with chalk or lime. It is found in great perfection in cottage-gardens in chalky countries, and should be cultivated by cottagers as a wholesome and nutritious food. The parsnip is an excellent root, and in soils suited to it will, under good management, yield a great weight of food, either for man or for cattle. It is grown to greater perfection in the islands of Guernsey and Jersey than any-where else, and is thence often imported into this country.

HORSE-RADISH.

This plant is propagated by cuttings of the root, either taken from the top an inch or two long, or some old roots cut into pieces of that length. It is so tenacious of life that almost every inch of the root will grow, and when once established in a piece of ground, is not easily eradicated.

To propagate it, procure a number of proper sets, which may be either the small off-sets that rise from the bottom or sides of the main roots, and of which take cuttings of their tops two or three inches long; or use the tops and crowns of the old roots when taken up for use, in cuttings of the above length: or in default of a sufficiency of crowns or tops of either, divide a number of old roots into cuttings of the above-mentioned length, which if furnished, each with two or three

buds or eyes, will make tolerable sets: but preference should be given to the cuttings of the crowns or tops, if a proper number can be procured; observing that when intended to make a fresh plantation, you should, during winter, when the plants are taken up for use, reserve all the best off-sets for planting; also the crowns of the main roots: but this latter is only practicable in private gardens; for where the large roots are designed for sale, their tops must not be taken off, which will render them unsaleable in the market; therefore the market-gardeners always reserve the strongest off-sets arising either from the bottom, or emitted from the side of the main root.

Being thus furnished with a proper number of sets, trench the ground to the depth of two feet, and add a slight body of manure; plant the sets in with the spade or large dibble, rake the surface smooth, and sow it with spinach, if such should be wanted. As horse-radish is a coarse growing vegetable, and not always easily kept clear of weeds, in consequence of its roots running in all directions, which would be apt to be injured by digging or hoeing, it would be advisable to plant it in some part of the slip, or outer parts of the garden, where it may be seen as little as possible; nevertheless, plant it in a situation where it will not be under the shade of trees.

In taking up these roots, it should be done regularly, not taking up a stick or root here and there, as we often see done in private gardens, but beginning at the first row, and proceeding from row to row, as it is wanted.

THINNING THE CROPS OF WINTER LETTUCE.

The crops of winter lettuce should now be thinned, and the ground between the plants hoed and stirred; this will greatly encourage the growth of the plants.

SOWING AND PLANTING LETTUCES.

About the beginning or middle of this month, if the weather be mild, sow several sorts of lettuce-seeds on warm borders. The white and green cos, and the Silesia and cabbage-lettuce, are proper sorts; also sow some of the imperial and brown

Dutch lettuces, or any other sorts; let the seeds be sown moderately thick, and rake them in regularly.

Or, in order to have a few lettuces forwarder for transplanting, sow lettuce-seeds early in the month in a frame, and cover them occasionally with glasses or mats, at night and in sharp weather; and when the plants are advanced about two inches in growth, they are to be transplanted in the open ground.

Lettuces which have stood the winter, closely planted in warm borders or in frames, should, about the end of the month, if quite mild weather, be thinned out where they stand too close, leaving them a foot distant each way: the plants which are drawn out should be planted in an open spot of rich ground, a foot asunder; and a little water given as soon as planted.

We have experienced much success in planting lettuce at the bottom of a north wall, or in any such situation, where the sun seldom shone upon them till late in the afternoon. It is the sudden transition from cold to heat, or of sunshine upon vegetables after severe frosts, that our early crops are destroyed in this uncertain climate. It ought to be our study to dispose of and shelter them, as much as possible, from the effects of such transitions. It is also of importance, particularly in autumn-planting, to throw up triangular ridges, two or three feet high, of convenient lengths, from east to west, and to plant both sides of the ridge with lettuce-plants. In this case, if the plants upon the side sloping towards the sun should be destroyed, those on the opposite side will have a chance to stand. Should both stand, this method will prolong their season, as when the crop on the south side is exhausted, that on the opposite will be fit for use.

PLANTING ESCHALOTS.

If eschalots were not planted in January, now is the proper season for that purpose, ample directions for which will be found in the preceding month.

RADISHES.

Dig a warm border, the beginning of this month, for some short-topped radish-seed, to succeed those sown last month. Dig another piece at the same time, and sow it with salmon-radish-seed; they will succeed the short-tops. About a fortnight or three weeks after, let some more of both sorts be sown in an open situation, in larger portions for the main crop, that there may be a regular and plentiful supply in the proper season; also sow a little of the red and white turnip-radish for variety.

PLANTING LIQUORICE.

Prepare some ground to plant liquorice where required; the ground should have two or three spades' depth of good soil, and also trenched the same depth, that the root, the only useful part, may run very deep into the earth.

Procure sets of the small horizontal roots, which run near the surface of the ground; cut them into lengths of six inches, and plant them by dibble, in rows a yard asunder, by half that distance in the row, placing them wholly within the earth; as soon as planted, sow a thin crop of onions on the same ground the first year. Keep them clean from weeds all summer; and when the onions come off, hoe the ground well; and in winter slightly dig the ground between the rows.

They must be permitted to have three years' growth, cutting down the decayed stems every October or November; and in the third or fourth year, the main roots will be of full length and size; then dig them up in winter, beginning at one end of the ground, and opening a trench quite to the bottom of the first row of roots; so continue row and row, taking out all the roots as you proceed to the bottom.

WORK TO BE DONE THIS MONTH IN THE CULINARY GARDEN.

The process of trenching and digging should be continued, if not finished last month; and every thing there recommended should be done as soon as possible, as the following months are amongst the busiest of the year with the gardener.

MARCH.

PLANTING BEANS.

Plant beans of any kind, for all sorts succeed well from this time of planting; now plant full supplies of the best sorts for principal crops.

This is still a proper time to plant the Windsor, Toker, and Sandwich, and the long-podded bean, which is a great bearer. The smaller kinds may also be planted any time this month, being plentiful bearers; among which, the white-blossom kind is a peculiarly fine eating bean.

Some of the most approved of the above sorts put into the ground every fortnight, will afford a regular supply during the season.

Plant the large kind of beans in rows a yard asunder, and the lesser kinds, thirty inches between the rows. But, if it be intended to plant savoys or cabbage-plants between them, the rows, for all the sorts, should be a yard and a half apart.

Transplant the beans sown in pots or boxes, as previously recommended. Take them carefully out of the boxes, or pots, separate them so as not to injure the roots, draw drills four inches deep, place the plants six inches apart in the rows, and from two to three feet between the lines; fill in the mould round the stems, and give a little water, if the weather be dry, to settle the mould about the roots. Shade or protect them for a few days with branches. The beans recommended to be sown thick in the borders in autumn, if they have stood the winter, should now be transplanted, as has been formerly directed.

SOWING PEAS.

Sow marrowfat peas once a fortnight or three weeks at farthest, particularly some dwarf green imperial marrowfats, which are a most excellent eating pea.

Or, in sowing peas, it is a good rule, when the plants of a former sowing are coming up, to sow another crop of the

same sort, which will succeed the others in regular order of bearing.

Any of the larger or smaller kinds mentioned in the former months, may be sown for general crops. Draw drills at the distance mentioned in February, sow them regularly, and cover them with earth about an inch and a half deep.

All the sorts should now be sown in open situations, not under low spreading trees.

Transplant the peas which were sown last month on hot-beds, or in flat boxes; they will, if attention has been paid to them, be hardy enough to transplant, if the weather be tolerably mild. In doing so, make shallow drills with a hoe or spade; then remove the peas carefully in patches, which will not be a difficult task; the pieces of turf which were recommended to be placed under them, will readily separate, and each piece should be carefully placed in the drill prepared for them, with the peas growing upon it. Cover the peas to within an inch of their whole height with light mould. If the weather be dry, give a little water to settle the mould about them; if frosty, protect them for a few nights with branches, or any other slight covering.

EARTHING AND STICKING PEAS.

Draw earth to the stems of such peas as have attained some height; it will strengthen the plants greatly, and encourage their growth.

Stick peas as the different crops advance in growth, six or eight inches high.

TRANSPLANTING AND SOWING CAULIFLOWERS.

Remove the cauliflower-plants, which have been in frames, or on warm borders, during the winter, if not done in the former month.

Let these be planted in a good spot of ground, which should be well manured with some good rotten dung, and then neatly dug or trenched, one spade deep; bury the dung in a regular manner in the bottom of the trench. Plant the cauliflowers in

rows thirty inches apart, allowing them the same space between plant and plant.

The spot, where this crop of cauliflowers is planted, may be sown with spinach and radishes, as was intimated last month.

Raise some earth to the stems of the plants, which are under hand or bell-glasses; it will strengthen them and assist their growth.

The glasses may still be kept over the plants, but must be continually raised, at least a hand's breadth high; or in fine days, the glasses may be taken off, and let the plants have the benefit of warm showers of rain.

Where cauliflower-plants have been raised from seed sown the last month, they should now be removed into a bed of good earth, in a warm situation; but where a moderate hot-bed can be obtained, it will be most advisable to prick them into it, which will forward them greatly. Make the bed about sixteen or eighteen inches high, and set a frame on it, or arch it over with hoops; lay on half a foot of rich earth, prick out the plants in it, two or three inches apart, and give them a little water. Set the glasses or other covers on every night, but remove them every mild day.

By placing out the plants on a moderate hot-bed, it will bring them forward to be fit to transplant the middle of April into the place where they are to come to maturity, and they will produce their heads in July.

Cauliflower-seed may be sown early in this month, if it were not done in February; observing to sow it in a moderate hot-bed, as was then directed; it will bring the plants up soon, and assist them greatly.

The seeds may be sown in a bed of good earth, in a warm situation on an open spot of ground; they will grow freely, but the plants will not be so early by ten or twelve days, as they would be, if the seed were sown on a slight hot-bed.

The plants from this sowing will come in for use in August.

SOWING BROCCOLI.

It will be early enough towards the middle or the end of the month to sow broccoli, for if sown earlier, the plants are

apt to start or button. The early white, the tall purple, the green or the dwarf sulphur-colored kinds, are the best to sow; the seed must be sprinkled thinly, on a bed of light earth, and in a warm open situation; it must be covered to about a quarter of an inch in depth, and raked in fine.

TRANSPLANTING AND SOWING CABBAGES.

Transplant cabbage-plants of all kinds, into the places, where they are to remain to cabbage. It may be done the beginning, or middle of this month, but if the plants be strong, the sooner it is now done, the better. Let them be planted in good ground, well manured, at two feet and a half distant.

This distance is meant for such plants, as are to remain to grow to their full size; but such of the forward kinds as are to be cut young, may be planted closer; and eighteen or twenty inches distant will be sufficient.

Sow the seeds of cabbages of any kind, the beginning or middle of this month, particularly the early kinds for successional young summer-cabbages, and large sorts for autumn and winter use. The large sugar-loaf is a fine kind to sow now, also the Yorkshire, Battersea, and imperial, for midsummer and general autumn cabbages. A quantity of the large, hollow, long-sided, and large round cabbages, may now be sown for late autumn and general winter use: let the whole be sown in an open spot of good ground, each sort apart. In sowing them, let each sort be correctly labeled, which should be a rule with every seed that is sown.

The plants produced from this sowing will, particularly the early sorts, be well cabbaged in August and September, especially the sugar-loaf, Battersea, and Yorkshire kinds, and will remain good all the winter.

Red cabbage-seed should also be sown towards the latter end of this month, to raise some plants for winter use; they will be well cabbaged in September, or about Michaelmas, and keep good till the spring.

In sowing the several sorts of cabbage-seed, it will be most proper to sow them in open ground, at a distance from trees, fences, or buildings; for when sown in such close situations,

as is very often practised, the plants are drawn up weak and slender, and are liable to be destroyed by vermin.

SALSIFY, SCORZONERA, AND SKIRRET.

Salsafy, Scorzonera, and Skirret, are all raised from seed, and are used in the kitchen, in autumn and winter. They may be sown about the end of the month, for if sown at an earlier period, they often run to seed, and are thereby rendered wholly useless.

SOWING SAVOYS.

Savoy-seed for a principal crop, to serve from about Michaelmas to Christmas, should be sown about the middle, or towards the latter end of the month, in an open situation.

But if it be desired to have savoys well cabbaged in the end of August, or any time in September, they should be sown in February, or at least the first week of this month. Savoys answer best on a light rich soil; poor or exhausted ground should be well manured. Allot an open compartment, that the seedlings and advancing plants may grow stocky, and not draw up weak and long-shanked, as they are liable to do in close situations or narrow borders under walls. Gardeners distinguish two chief sorts, green savoy and yellow savoy, and of each of which there are, round-heading, oblong-round heading, sugar-loaf heading, &c. The round-heading is the most permanent. In these varieties, there is no material difference, though the green has certainly the best appearance at table, and always proves the hardier, in standing long rigorous seasons: both sorts are, in general, hardy enough to stand our ordinary winters.

The seeds of this vegetable are possessed of the property of retaining their vegetating properties for six or eight years, provided that they were sufficiently ripe, when gathered; and we are informed by Bastien, that the seed-growers of Auberwilliers assert, from their own experience, that the seeds obtained from the middle flower-stem, will produce plants sooner fit for use, than those which have originated from seeds ga-

thered from the lateral flower-stems. This curious circumstance has not altogether escaped the notice of some of our olden gardeners.

PLANTING POTATOES.

About the middle or latter end of this month, it will be proper to plant potatoes on a border, which is light and early. The ground need not be manured for this crop, if it be in a tolerably good condition; for as the produce is seldom allowed to arrive at its full maturity, the soil will consequently not be exhausted, which is the case only when the potatoes are allowed to remain in the ground until they be fully ripe. In those cases, however, where it is intended that the crops shall stand until they have come to maturity, it will be necessary to give the ground a good dressing of manure.

The ash-leaved and early dwarf, but particularly the former, are the best kinds to be planted at this season, as they require less room than any other kinds. They may be planted six or eight in a line, and about fifteen inches between each line. If the ground be in any degree wet or damp, they may be planted in drills about three inches deep; but if it be light and dry, they may be dibbled in. It must be observed, however, that this method is recommended only to save time, as the drill is to be preferred to the dibble for all kinds of seeds and roots.

Potatoes may be planted with propriety in ground which has been under the same crop the preceding year. This is, however, with a few other vegetables, an exception to the general rule of changing their situation annually. In Cornwall, the same ground that has borne a crop of early potatoes is frequently planted with a late or winter crop, and both are found to succeed to perfection. The same practice is not uncommon in Ireland, and many parts of Lancashire. In Cornwall, they always procure their seed-potatoes, either every year or every alternate year, from a granite soil, knowing from experience, that the great increase in the produce, justifies the additional trouble and expense.

SOWING BRUSSELS SPROUTS.

Brussels sprouts may also be sown any time in the month, and the same system adopted as directed for broccoli.

TURNIPS.

Sow turnips for a first early full crop about the middle or towards the latter end of this month, in an open situation, and where the ground is light.

Turnips may be sown at the beginning of the month, if required; but those sown so early are apt to run to seed before they bulb of any considerable size in the root.

If a little turnip-seed be sown the first week of this month, or the last week in February, on a slight hot-bed, the plants will be more likely to bulb before they show a disposition to run to seed, and will be an acceptable addition to the spring vegetables.

The proper sorts to sow now are principally the early Dutch white and the early stone, especially for the first and second crops.

PLANTING ARTICHOKEs.

Where a plantation of artichokes is intended, let them be planted as soon in the month as you can procure good plants; otherwise defer it till April, observing that those suckers slipped off in spring-dressing the old plants, are the proper sets for this purpose.

There are two sorts in general cultivation, the large globe artichoke and the French or green oval; the former is greatly to be preferred for the general supply, the heads being larger, and the eatable parts more thick and fleshy.

They should be planted in an open situation, and in good ground; also let a quantity of rotten dung be spread over the piece, and dig it in. Having provided some well-rooted suckers, trim any straggling parts of the top and root; then plant them with a dibble, in rows a yard and a half distant, and two feet, or a yard, distant in the row. Give them directly

some water. This plantation, if kept clear from weeds, and now and then watered in dry weather, will yield good artichokes the following autumn, but will produce more abundantly next year in June, July, and August.

A small crop of lettuce, radishes, or spinach, may be sown the first year, between the rows of the artichokes.

A plantation of artichokes will produce good heads five or six years, and often longer; but it must be observed, that if required to have a succession of this vegetable for four or five months in the summer, a small plantation should be made every spring; for the old stocks, which have been planted a year or two, produce heads in June, July, and August; and those planted now produce heads the same year, in August, September, and October.

SPRING-DRESSING ARTICHOKEs.

Make a general dressing of artichokes from the beginning to the middle of this month.

Where the earth has been trenched up, and laid over these plants, to defend them from frost, let it now be levelled down, particularly if the plants have begun to shoot tolerably strong, otherwise defer it till next month; observing as you proceed in levelling down, to dig and loosen all the ground about the plants; at the same time examine the number of shoots or suckers springing from each stool or root, choosing two or three of the strongest on every stool to remain, and all above that number to be taken off close with the hand.

In performing this work, open the earth deep enough about each stock or root, that you may more readily slip off the superabundant shoots clean from the place whence they spring, taking care, as above, to leave at least two or three good shoots, but never more than three, upon each root or stock, closing the earth in again round the root, and also about the young plants, laying the ground close about them with the hand.

The shoots which are slipped off, may be used to make fresh plantations, where required; for artichokes are propagated by planting the young shoots, and by no other method; and this is the most proper season for that purpose.

CELERY.

Celery, for a full crop, may be sown about the latter end of the month, on a bed of light earth, in an open situation. If the seed be sown in rich vegetable mould and kept rather moist, it will thrive the better. Water the bed frequently in dry weather.

The common upright celery, the large hollow upright, the solid stalked upright, and the large red stalked upright, are the sorts most cultivated: the three former are preferred for general crops. The latter variety is rather coarse for salads, but being very hardy stands the winter, and is well adapted for the use of the kitchen, either for soups or stews. After the plants have attained three or four inches in height, they should be transplanted on a bed of solid dung well rotted and beaten into a solid mass with a mallet, or the plants should be pricked out in a very rich border.

CELERIAC.

Celeriac, or turnip-rooted celery, is much hardier than any of the other sorts, and will continue longer in spring. It is often imported from Hamburg for the London market, and is universally cultivated on the continent. The seeds should be sown, and transplanted, as has been directed for celery, only they should be sown thinner, and a greater supply of water given to the plants in all the stages of their growth.

The following is the method of cultivating this vegetable in Denmark, according to the system of Mr. Jens Peter Petersen, and communicated to the Horticultural Society by W. Atkinson, Esq. F. H. S.

“Celeriac requires a light, moist, and rich soil. It is essential that the dung be perfectly decomposed. For summer and autumn crops, sow the seed towards the end of February, very thinly, on a moderate hot-bed, in good rich mould. When the plants appear, they must be inured as much as possible to the open air, and thinned so as to stand one inch apart from each other, and always kept moist. Transplant about the middle

of May, or when the plants are four inches high. The roots will be fit for use at the end of July. For a winter crop, sow about the end of March, on a rich warm border; when about an inch high, thin and keep them moist. In June, they will be fit for transplanting: this is to be done on flat beds, four feet wide; four drills are drawn four inches deep, in these the plants, after some of the roots and tops of the leaves are cut off, are put in at the distance of one foot apart, watered and kept so, if the weather be dry. When grown to half their size, which will be about the beginning of August, a small quantity of the mould round the root of each plant must be removed, taking care not to disturb nor expose the main root. Cut off all the side roots and the large coarse leaves close to the plant, levelling the mould to each as you proceed in the work. When the whole is completed, the bed must be sufficiently watered.

Celeriac may be considered as a bulbous variety of celery, and therefore, to be eatable, it requires to be blanched; for which purpose, it must be earthed up to a certain extent, but the less, the better."

PLANTING JERUSALEM ARTICHOKE.

This month is the proper time for planting Jerusalem artichokes, and being of a very hardy nature, they will thrive in any situation, and even in a soil of an ordinary kind: they are not easily eradicated, when once introduced into a garden. The Jerusalem artichoke is propagated in the same manner as the potato, by planting the root, in rows about a yard asunder, and nine or ten inches distant from each other in the row. It is very productive, and consequently, a small quantity will suffice an ordinary-sized family. Nicol observes, "The roots grow in tubers, something in the manner of a yam; the stalks tall and upright. In taste, the roots resemble an artichoke, and hence the name. This vegetable, before the introduction of that most valuable one, the potato, was held in great esteem; being an excellent winter-root of an agreeable taste."

SPRING-DRESSING ASPARAGUS.

About the middle or latter end of this month, spring-dress asparagus-beds, which is done by forking or slightly digging them with a three-prong'd fork. For the purpose of digging or forking these beds, be provided with a proper fork, having three short prongs, six to eight or nine inches long; however, if such instrument be not at hand, it may be performed with a small, short-prong'd common dung-fork.

In forking the beds, be careful to loosen every part to a moderate depth, taking great care not to go too deep to wound the crowns of the roots.

The work of forking is necessary to be done every spring, to improve and loosen the ground, and to give free liberty for the buds to shoot up; also to give free access to the sun, air, and showers of rain.

The beds being forked, they must be raked even; observing, if they be not raked immediately after they are forked, to defer it no longer than the end of this month, or the first week in April, for by that time, the buds will begin to advance towards the surface.

The beds being carefully forked over, a little well-broken mould should be scattered over them from the paths between the beds, or a top dressing of compost, made half of dung well rotted, and the other half of fresh virgin loam, will very much improve the strength of the roots. In raking the beds, make use of an old rake, the teeth of which are worn short, and which will smoothen the surface, without injuring the buds.

PLANTING ASPARAGUS.

New plantations of asparagus may now be made, if the weather be mild, this being the proper season to remove the plants.

In making these plantations, the chief point to be considered is to make choice of a proper soil: choose the best the garden affords; it must not be wet, nor too strong, nor stubborn, but such, as is moderately light and pliable, so that it will readily fall to pieces in digging or raking, and in a situa-

tion that enjoys the full sun. If the ground do not naturally possess these qualities, it must be brought as near to that state as possible, by artificial means.

Asparagus is often found to prosper in strong land, but it is apt to go off in winter. In light sandy, or light loamy soils, if well supplied with manure, it succeeds much better, and is not liable to perish in winter. Sea-weed, where it can be procured, is an excellent manure for asparagus. The ground should, if it be intended to have fine crops, and that the beds should last for a number of years, be not less than two or two and a half feet deep, burying plenty of dung at the bottom, as no more can be applied to any depth afterwards. Asparagus, when found in its natural state, is in poor sandy spots by the sea-side, and is of such a diminutive size, that few cultivators, without some botanical knowledge, would imagine it to be the same plant, which they grow to such a size by force of dung and cultivation. The sweetness, size, and tenderness of the shoots, which are the only part used, depend entirely on the rapidity of their growth, and this is to be effected only by the richness of the soil. The commercial gardeners in the vicinity of London consider damp ground so injurious to asparagus, that they elevate their asparagus-beds considerably above the surface-level of the ground, and the same practice is also common in the environs of Paris. In the Memoirs of the Caledonian Horticultural Society, the following is given by Dr. Macculloch, as the method practised in France, and adopted in some parts of Scotland: "A pit, the size of the intended plantation, is dug five feet in depth, and the mould which is taken from it must be sifted, taking care to reject all stones, even as small in size as a filbert-nut. The best parts of the mould must then be laid aside, for making up the beds. The materials of the bed are then to be laid in the following proportions and order: six inches of common dunghill manure, eight inches of turf, six inches of dung as before, six inches of sifted earth, eight inches of turf, six inches of very rotten dung, eight inches of the best earth. The last layer of earth must then be well mixed with the last of dung. The compartment must now be divided into beds five feet wide, by paths constructed of turf, two feet in breadth and one foot in thickness.

Beds made in this manner," he says, "are found to answer well, and last for many years."

In Germany, asparagus-beds are made to last a considerable time, by being well trenched and manured at bottom with bone, horn, chips of wood, or branches of trees, a foot thick. Bones and horn will be a long time in decaying, and will, consequently, give out a gradual and lasting food for the roots of the plants. The ground intended for new beds should have a large supply of rotten or other good dung laid several inches thick; it should then be regularly trenched two or three feet, and the dung buried equally in each trench as the process goes on.

The ground being made level, divide it into beds four feet and a half wide, with alleys two feet wide between bed and bed.

Four rows of asparagus should be planted in each bed, and ten or twelve inches distance to be allowed between plant and plant in the row; letting the outside rows of each bed be nine inches from the edge; or they may be planted only in single rows, two feet and a half apart, or in narrow beds containing two rows of roots only. By this means, a greater facility will be acquired in gathering the crop, without being obliged to tread on the beds.

Let it be observed, that the plants for this plantation consist entirely of roots, not more than two years old; some gardeners prefer those that are only one year, as they generally take root much freer, and succeed every way better than two-year old plants. It is of very great importance for ensuring success in the planting of asparagus, to lift the roots carefully, and to expose them to the air as short a time as possible. While planting, therefore, it would be proper to keep the roots in a hamper or basket among a little light earth, and covered with a mat. No plant feels an injury in the root more keenly than asparagus; the roots are very brittle, and when once broken, do not readily shoot again.

Method of planting them.

Strain the line parallel with the beds, nine inches from the edge: then with a spade cut out a small trench or drill close to the line, about six inches deep, making that side next the line nearly upright; and when one trench is opened, plant that

before you open another, placing the plants upright ten or twelve inches distant in the row; or the ground may be drilled for the roots to the depth of four or five inches with the garden hoe. This is the most expeditious method, and answers equally well.

These plants must not be placed flat in the bottom of the trench, but nearly upright against the back of it, so that the crown of the plants may stand upright, and two or three inches below the surface of the ground: let them be all placed an equal depth, spreading their roots somewhat regularly against the back of the trench, at the same time drawing a little earth up against them with the hand as you place them, in order to fix the plants in their due position, till the row be planted: when one row is planted, immediately with a rake draw the earth into the drill over the plants, and open another drill or trench as before directed; and so on till the whole be planted. When they are all planted, let the surface of the beds be raked smooth, and clear them from stones.

At the corner of every bed, let a firm stake be driven into the ground, to serve as a mark for the alleys, and one also at the end of each row.

In planting asparagus, it is customary with those gardeners, who are obliged to make the most of every spot of ground, to sow a thin crop of onions the first year on the new asparagus-beds: this should be performed before the beds are raked, sowing the seeds, and raking them in; by this means a crop of onions may also be obtained without hurting the asparagus, provided the onions be not suffered to grow just about the plants; but, if circumstances will admit, it will be much better not to exhaust the beds with any crops at all.

The asparagus being planted, the next care is, when the plants come up, which will be about the latter end of the succeeding month, or the beginning of May, to keep them clean from weeds; which must be well attended to during the summer. It will be three years from the time of planting before the asparagus plants produce buds large enough to cut for use, in any general gathering; though sometimes in good ground, and a remarkably prosperous growth in the plants, which are the production of young shoots, a few of the largest may be cut the second year after planting: it will be doing greater

justice to the plants, if none be cut before the second, and only a few the third year. A plantation of asparagus, if the beds be properly attended to, will continue to produce good buds ten, fifteen, and often twenty years; instances have occurred of beds being cut for thirty and forty years.

In making new plantations, instead of forming the beds with plants, the seeds may be sown at once in the beds; by this practice, the plants are not disturbed by being removed, and consequently produce more regular crops. The beds may be made the same as if they were to be formed with young plants, and the seeds dropped in, in lines, covering the seeds about an inch deep.

When the plants are about six inches high, they must be thinned, leaving the strongest about nine or ten inches apart. During the first season, keep them clear of weeds, as they will be very tender, and easily hurt by the weeds. In about three years after sowing, a few buds may be cut. The fourth year, the buds will be both strong and abundant.

SOWING PARSLEY.

Parsley, if not sown last month, may now be sown. Sow in drills in the quarters, or for edgings, observing to sow it where hares cannot get at it, as they are remarkably partial to this vegetable.

If a large supply be wanted for market, it may be grown in continued rows nine inches asunder, or on the general surface, to be trodden down and raked in.

SOWING PARSNEP.

If parsneps were not sown in February, sow now for a principal crop. This is a nutritious and useful vegetable, and in some countries is next in estimation to potatoes. (See *Carrots*.)

SOWING SPINACH.

Sow spinach to succeed that sown last month: the sowings should be repeated once a fortnight or three weeks, to have a regular supply, for the plants of one sowing in spring and

summer will not continue fit for use longer than that time, before they will run. Prefer the round-leaved or smooth-seeded kind; that being the most proper sort to sow at this season, its leaves being considerably thicker and larger than the prickly-seeded.

This seed may be sown either alone, or with some other crops, such as between rows of beans, or on the ground between cabbages or cauliflowers; it should be sown moderately thin, and generally in broad-cast, in which method a little radish-seed may be sown with it: when the seed is sown, if light dry ground, tread it over lightly to settle the surface and seed, then rake it regularly; or it may be occasionally sown in broad flat drills, about an inch deep, and a foot broad.

Let it be observed, that spinach should not, at this season, be sown where the ground is much shaded with trees or bushes; for in such situations, the plants would be drawn up to seed before they arrive at half their growth.

Hoe or hand-weed the early crops, thinning the plants at the same time, but particularly those sown broad-cast, to five or six inches distance; the thinner they are, the larger they will grow.

The crop of winter spinach, which was sown last autumn, will now be advancing for use, and should be kept clear from weeds, and the earth between the plants stirred with a hoe. In gathering, if they stand close, they should be thinned out clean by the roots; but if they already stand at great distances, only crop the large outer leaves as wanted, till they begin to run, then cut them up clean to the bottom.

SOWING HAMBURG PARSLEY.

At this time, sow Hamburg parsley for a full crop. As this is not much used in the majority of families, a small quantity will be sufficient.

SOWING BEETS.

For successional crops, sow a little both at the beginning and also at the end of the month, if favorable weather. *For the general crop, see April.*

PLANTING CHIVES.

If chives were not planted last month, let that be now done.

MUSHROOM-BEDS.

Continue to protect mushroom-beds from frost and rain, either of which would destroy the spawn. And if convenient, new beds may also be made, which will produce in succession, during the summer and autumn.

PLANTING HORSE-RADISH.

Where horse-radish has not been already planted, let that be done as soon as possible, as the buds will be beginning to spring and might be injured by the operation.

SOWING LEEKS.

This is a good time to sow leeks for a full crop in strong lands, but if they have been forwarded on a slight hot-bed, the greater will be their size. On light warm sandy soils, they will be yet in good time in the open ground. Sow in beds to be afterwards transplanted, or thinly in such beds, where they are to remain to come to their full size.

SOWING KIDNEY-BEANS.

About the middle of the month, if the ground be dry, and the weather settled, sow a crop of kidney-beans: they should be planted in a warm sheltered situation, and may be sown longitudinally along the border, and when necessary, after they come up, use the pea-glass case recommended for early crops of peas.

Kidney-beans, like many other fast-growing vegetables, are much improved by transplanting. For this purpose, sow in the beginning of the month a few in pots or boxes; bring them forward in any of the forcing departments; the peach-house is to be preferred, or in a slight hot-bed. Harden them by degrees; by the end of March, they will be fit for planting

out in a warm border, or at the bottom of a wall, and will be in fruit sooner, and yield a more prolific crop, than those planted in the open border in the beginning of the month. Make choice of a dry day for planting the crop in the open air, and plant on the surface, in strong soils, as recommended for peas; cover three inches, and leave the covering in the form of a ridge, so as to throw the rain off, as they are very tender, and apt to rot in the ground. For a full crop, see *April*.

PLANTING POTATO-ONIONS.

See *December* and *January*.

SOWING ONIONS.

Onions require a rich mellow soil, on a dry subsoil, and are an exception to the general rule of never cropping the same ground successively with the same plant. Some gardeners sow onions on the same piece of ground for many years, and the market-gardeners at Hexham sow their onions on the same ground for twenty or thirty years successively, but annually manure the soil. After the ground is dug, the manure is spread on the surface, in a very rotten state, and the onion-seed is sown upon the manure, and covered over with mould from the alleys: by this method, they produce fine crops in almost all seasons. Indeed, so general is this practice, that it would require much reasoning to persuade them to the contrary. Onions must naturally act (to a certain extent) as an exhauster of the ground on which they grow, at least of those parts of the ground from which they derive their principal nourishment; yet we find the same piece of ground for twenty years producing excellent crops. If the ground be prepared as advised in February, which is to manure it in autumn, and to rough dig it, which is to be done by digging in the compost manure, and laying the ground up as rough as possible, so as to present as large a portion of surface to the action of the frost and rain, as can be done, it becomes to a certain degree renewed, as the fibrous parts of onions, which are, correctly speaking, their roots, penetrate only a few inches

deep, and if they partly exhaust the surface of one year, the operation of digging deep brings up an entirely new surface for the crops of the next. Take advantage of a fine day, when the ground is dry, to point over or slightly dig the surface, and in doing so, break the clods well with the spade, or rake the surface with a large rake, as the operation of digging proceeds. Drill the ground an inch deep, and sow the seeds reasonably thin; but in this particular, be guided by the quality of the seed, which can be ascertained by sowing one hundred, or fifty, or twenty seeds in a pot or pan, which may be placed in any of the forcing departments to vegetate quickly. Count the number of plants which come up; by this means, the quality of the seed can be correctly ascertained, and then sow thickly or thinly, according to the result of the experiment. The drill system is to be preferred.

One of the most intelligent writers, as a practical gardener, in the Memoirs of the Caledonian Horticultural Society, adopts the following method of preparing the ground for his onion crops in light soils, and which has been attended with great success, both as to the production of good crops and as a preventive for the maggot, which in old garden ground, if light, is found to be very injurious to these crops: "In the end of October," he says, "I dug over the ground, leaving as much surface exposed as possible, by what is called winter digging. It lay in that state till the end of December, by which time it generally happened to be exposed to a severe frost. On a frosty day, about the beginning of January, I wheeled on a top dressing of cow's dung, and spread it all over the surface. I let this lie to have its juices washed into the soil before the time of sowing, at which time I raked off all the dung that would come with the rake, which operation smoothed the surface of the ground. Then, *without digging*, I lined off the alleys, sowed the seeds, trod them in, covered them with earth from the alleys, and raked the beds. From this mode of treatment I always had excellent crops of onions. This method gives a sort of consistence to old soft soils, such as are often to be met with in old gardens on gravelly or sandy bottoms; and the onions generally form their bulbs upon the surface, which I take to be their natural position, and where they are

less liable to the attacks of maggots than when they form their bulbs under the surface, which is principally occasioned by dunging and digging light soils for onions in the spring."

Any of the sorts in general cultivation may be chosen, according to the fancy of the sower, or the purpose for which they may be intended. The Strasburg, Deptford, and globe, are preferred for principal crops; the Portugal and Spanish are esteemed for crops which come the soonest into use; James' Keeping, and pale red, for keeping; the blood red is much sown in Scotland and Wales for its strong flavor, and is esteemed in the London market for its diuretic qualities; the Lisbon is a good sort for autumn sowing, but the Strasburg is generally sown at that time. For the distance between the rows, see *February*.

PLANTING ONIONS FOR SEED.

Where it is intended to save the seeds of onions, either for sale or private consumption, plant them at this time. Select some of the finest bulbs in the autumn, and reserve them for this purpose. Plant them in drills three or four inches deep, and one foot apart; place the onions ten or twelve inches asunder in the line, according to their size and sort. For the convenience of clearing them from weeds in summer, and supporting them when their heads become heavy; plant them in beds of three or four rows each, allowing two feet and a half between each bed, for the purpose of getting in among them. They have now only to be kept clear of weeds, and supported as they advance in growth, and will ripen their seeds in August or September.

SOWING CARROTS.

Crops of carrots may now be sown in light dry soils; sow in drills ten or twelve inches apart, and cover carefully about half an inch deep. The orange and Alteringham are the preferable sorts.

A spot of light ground, in an open situation, should be chosen for this crop, for the roots thrive considerably if those points be properly attended to.

The ground should be trenched one good spade deep at least, or rather it should be double dug. Observe in digging to take but thin spits, and be careful to break all clods, that the roots may have full liberty to run down long and straight, for if the earth be not well divided nor separated, the roots are apt to grow both short and forked.

The seeds may either be sown broad-cast all over the surface, or the ground may be previously divided into beds four or five feet wide; in either method, however, sow the seeds thinly with an even hand, and rake them in; but previously to raking, observe that, if the ground be quite light and dry, the seed may first be trodden in evenly, in doing which, take care to tread it lightly and regularly, pretty closely together, then let the seed be raked in moderately. By this method, the seed will be buried equally in every part, and the plants will also come up regularly.

In sowing these seeds, however, it will be proper to observe, that when the ground has a disposition to be wet, or is apt to bind, it will be proper, in that case, to divide it into beds four or five feet wide, with narrow alleys about a spade wide, then sow the seed. The ground, however, must not be trodden, but take your station in the alleys, and rake the seed in regularly, taking particular care not to draw the earth in heaps.

In sowing carrots, as well as most other crops, the drill system is to be preferred, as presenting a much neater appearance, and affording an opportunity of stirring the surface of the ground between the rows to a greater depth than can be done if sown broad-cast. The advantage of deep hoeing all crops cannot be too forcibly impressed on the mind of the cultivator, as it has the effects of resisting the droughts of summer, as well as greatly encouraging the growth of the plants.

SOWING RADISHES.

Sow more radish-seed, to raise a supply of radishes to succeed those sown in February.

There should be some seed, both of the salmon and short-top, sown at three several times this month; that is, about the beginning, middle, and latter end; by which means there will

be a regular succession of young radishes for the table. Let this seed be sown now in an open compartment, where the ground is rich and somewhat moist.

In sowing these seeds, attend to the method laid down in the two former months.

Thin the crops of early radishes, where the plants stand too close, pulling up the worst, and leaving the best plants standing at about two or three inches asunder, and clear them from weeds.

In dry seasons, let the early crops of radishes be frequently watered, otherwise they will not grow freely, nor will they be mild and crisp for eating.

SOWING INDIAN CRESS, OR NASTURTIUMS.

Indian cress will grow freely in almost every soil or situation, and the flowers of it are used both in salads and in garnishes. It requires to be staked in the manner of peas, if sown in an open spot. On account of its rapid growth, it is particularly well adapted as a hedge, or to act as a screen to any unpleasant object, independently of which it is, in itself, extremely beautiful. It may be sown in drills two inches deep any time during this and the two succeeding months. It will keep in flower till destroyed by frost.

SOWING CHERVIL AND CORIANDER.

Sow these seeds in shallow drills, eight or ten inches apart, and cover them about half an inch with mould. Choose a sheltered spot.

These herbs are all to remain where they are sown, and the chief culture they require is to be kept clear from weeds, but as the plants soon run up to seed, a small portion should be sown every month.

SOWING BASIL.

For the greater certainty of success, it will be advisable to sow basil in pots or pans, in any of the forcing departments, or on a slight hot-bed. Sow in rather dry mould, and be

sparing of water, as it is apt to rot. The plants will be fit for transplanting in May.

SOWING PURSLANE.

The end of this month is the proper time to sow this salad, for if it be sown earlier, it runs the risk of being injured by the frost, owing to its great succulency. It may be sown on a light early border, in the same manner as lettuce, but much thinner. It may also be sown like cresses in drills, on any open spot, once in three weeks or a month during the summer.

PLANTING MINT.

This is now a good season to make new plantations of mint.

This plant is propagated either by parting the roots, by slips of the young spring plants, taken up with root fibres at the bottom; also by cuttings of the young stalks in April and May; but at this season, increasing it by slips, or parting the roots, is most generally practiced, the method of which is as follows.

Towards the end of this month, have recourse to such old beds of mint as are well stocked with young plants, and thence draw up a sufficient number of the best shoots properly rooted, observing to draw them up carefully, and with the assistance of a knife at times, raise or separate them; by which care, every plant will rise with good roots.

Having provided the plants, let them be planted in rows, about six inches apart, and five or six inches asunder in the rows; let them have immediately a tolerable watering, to settle the earth close about their roots.

The method of increasing mint by roots is, to get a number of old roots, and let them be parted in a proper manner; then draw drills with a hoe six inches apart; plant the roots in the drills, cover them about an inch thick with earth, and then rake the ground.

But when the above method is to be followed, the roots should be procured and planted either in February, or the beginning of this month, or in October or November.

These plants will succeed in almost any soil or situation.

All the kinds of mint, such as spear-mint, orange-mint, pepper-mint, &c. may be increased by the above methods.

SOWING CAPSICUMS.

The seed-pods of these plants are much admired for pickling; let the seed be sown in a hot-bed, about the middle, or towards the end of this month, and when the plants appear, let them have a large portion of free air, and water them frequently. In the middle or latter end of May, they will be fit to transplant, which must be into beds of good earth in the open ground; or they may be sown in shallow boxes, pans, or pots, and placed either in a cucumber-frame or in any of the hot-houses. By sowing a few pots or pans full, a sufficient quantity will be reared for an ordinary-sized family.

SOWING LOVE-APPLES.

About the middle or latter end of this month sow tomatoes, or love-apple seeds: the fruit or apples of these plants are, in some families, much used in soups, and also as a pickle.

The fruit, when ripe, is of a beautiful red or yellow color. The plants are tender, and the seed must be sown in a slight hot-bed, treating the plants as directed above for capsicums. For the further management of them, see *May*.

SOWING AND PLANTING VARIOUS KINDS OF POT AND MEDICAL HERBS.

The seeds of dill, fennel, borage, burnet, bugloss, sorrel, marigold, orach, clary, and all other herbs of the same kind, may be sown any time this month, in a bed or border of common earth separately, and well raked in; most of which may remain where they are sown, if the plants be properly thinned; or some, as burnet, sorrel, fennel, clary, marigolds, borage, may be planted out in beds a foot asunder, in May, June, and July.

Plant rooted slips of balm, burnet, tarragon, tansey, penny-royal, feverfew, and camomile. In taking off the slips of these plants, preserve some root to each; plant them nine or ten inches from each other, in beds of rich earth

Sow hyssop, thyme, savory, and sweet-marjoram, any time this month. These seeds should be sown separately in beds of rich light earth, and raked in; or they may be sown in shallow drills, six inches asunder, covering them with fine earth a quarter or half an inch deep, or some may be sown in a single drill along the edges of borders, &c. where the plants will make useful edgings, particularly thyme, savory, or hyssop, as these sorts are perennials; the sweet-marjoram only being annual; but to forward sweet or knotted marjoram, it is most advisable to sow the seed on a slight hot-bed, to transplant it out, and treat it in the same manner as directed for sweet basil.

These plants may either remain where sown, or may be transplanted, for which purpose they will be fit in June: but if the former mode be adopted, they should at the above time be thinned to five or six inches distant, and those which are drawn out, may be planted in other beds, six inches asunder. Those which are sown for edgings need not be much thinned.

Plant cuttings of sage, hyssop, thyme, and savory, any time this month. These should be of the young shoots of last year, about four or five inches long, cut them off close to the place where they arise; but there are, sometimes, off-set shoots rising from the bottom of the old plants, that are furnished with roots, which should be particularly chosen. If cuttings be preferred, plant them under a hand or bell-glass in some light rich mould, and when rooted, transplant them, where they are to remain.

SMALL SALADING.

Cresses, mustard, radish, rape, &c. should be sown once a week in a dry warm border. But where the convenience presents itself of forcing-houses or hot-frames, prefer sowing them in flat boxes, for the purpose of taking the benefit of such convenience. Sow in light vegetable mould, or sandy earth,

or in rotten tan. They will do equally well, either covered or uncovered. In the latter way, they are less likely to be sandy or gritty. Place them in a dry place, as they are apt to damp.

SOWING NASTURTIUMS.

Same as Indian cress, see p. 118.

NORMANDY CRESS.

A crop of this beautiful and useful salad may be sown in a border of light earth. The seed must be sown thinly, as it grows luxuriantly.

SOWING LETTUCE.

Make sowings of the various sorts of lettuce. Sow each sort in a bed separately. The varieties are very numerous, but the majority of them will succeed equally well at this time, if sown on a sheltered border.

There is a sort not generally known, which we accidentally discovered some years ago in Scotland, among a crop of leeks. The seeds of the leeks were from Messrs. Peacock, nurserymen, Leith Walk, Edinburgh, who on inquiry stated, that the same circumstance was observed by another person, who also had purchased some of the leek-seed from the same bag. This sort Messrs. Peacock called, the New Cape cos. It grows to an extraordinary size, but notwithstanding its magnitude, it is the tenderest and finest lettuce we have ever seen. It requires to be sown in March, and afterwards planted out three feet distant, plant from plant, in a rich soil. We have since had seeds of the same sort from those very respectable seedsmen, and found them to be the finest lettuce, for a principal crop, with which we are acquainted. For variety, a number of sorts may be sown. Sow each sort separately, and if to remain in the seed-bed, sow thinly, or transplant a part, and leave a crop on the bed, in which they are reared. Transplanted lettuce run to seed sooner during summer than those, which have not been transplanted.

PLANTING LETTUCE.

Any time this month finally thin out the crops of lettuce, which have stood the winter, into open borders, at from nine to twelve inches apart, leaving a crop on the ground undisturbed. Those who wish to save lettuce-seed, may plant such sorts as may be wished at this time, giving them from twelve to fifteen inches from plant to plant, or more, according to their size. The crops of lettuce sown upon slight hot-beds will be ready by the end of the month to plant out in sheltered places; under favorable circumstances, they will succeed the winter-sown crops.

DANDELION.

This is an excellent salad, and a good stomachic: it is not generally cultivated in gardens. Where it abounds in any waste place, cover it at this season with rotten tan, decayed leaves, &c. It will soon come up, and be well blanched, in which state, it is a great addition to our spring salads. This salad will force well all the winter on a slight hot-bed, or in any very warm cellar.

CORN-SALAD, OR LAMB'S LETTUCE.

This is also an addition to our spring salads, not very generally cultivated; where it is desirable, sow some of the seed this month on a border of light earth. Continue to sow once a month till August.

AMERICAN CRESS.

This is often called black American cress and French cress. It is an excellent winter and spring salad, and being a native of most parts of this country, stands all seasons with little protection. If wanted all summer, sow every six weeks from this time till August; for which, see that month.

WINTER CRESS.

The use and culture, the same as the American cress.

WATER CRESS.

This well-known and useful salad, is said to have been first cultivated in 1808. If plantations be wanted of it, they may now be made, or indeed in any spring or autumnal month. For full directions, see *May* and *June*.

WORK TO BE DONE IN THE KITCHEN GARDEN.

If the weather be now favorable, that is, dry and mild, the various branches of cropping should be attended to with diligence. No time should be lost in committing to the soil the requisite seeds and roots of plants.

In early light dry soils, it will be an advantage to sow and plant early, whereby the crops will gain sufficient strength to resist the droughts of summer; but in such as are cold, wet, and late, the state of the weather must determine the time of sowing. It is always better to wait until the ground be in a fit state to receive the seed, than to sow too early, when it is not in such good order, as many of the less hardy seeds will not vegetate freely, indeed scarcely at all, if sown at this early period of the year, when the ground is wet. Let all coverings be removed which were used in protecting vegetables during the winter, and rough dig all ground not immediately required.

The gravel-walks should now be put in order for the season, and all unpleasant objects removed from this time till the end of autumn; for an equal degree of order and neatness is as necessary in the culinary garden, as in that appropriated to flowers alone.

A P R I L.

PLANTING BEANS.

Plant more beans as a successional crop to those planted the preceding month, and earth up those already above ground, accordingly as they may require it. Hoe the ground frequently between the rows, both to destroy the weeds and promote the growth of the beans. If any have been sown for transplanting, let that now be done; for which, see *March*.

SOWING PEAS.

Sow more peas for a successional crop, and earth up such as are in want of it. Stick such as are about four or six inches high. If any have been sown for transplanting, let it now be done.

MANAGEMENT OF CAULIFLOWERS.

The early cauliflower-plants under hand-glasses, should have earth drawn up round their stalks. This will be of great service in promoting their growth; but let due care be taken that no earth be drawn into their hearts, for that will prove very injurious to the plants.

The hand or bell-glasses may still be kept over these plants at night, and during cold wet weather; but in fine days, and when there are warm showers, let them be exposed to the free air; but when the plants are advanced in growth, the glasses should be tilted proportionably high on props, first raising a border of earth two or three inches high about the plants, then place the props upon that, and set the glasses on the props; but about the end of the month, if the plants be large, they should be taken quite away.

Where any of the winter standing cauliflower-plants in frames, borders, &c. were not finished planting out last month, let it now be done, as there directed.

Young cauliflower-plants raised from seed sown last month, should now be pricked out into nursery-beds, or some in a hot-bed, to forward them for final transplantation.

The cauliflower-plants which were produced from seed sown early this season, should be removed about the latter end of this month, if sufficiently strong, if not, defer it till next month.

Choose a piece of good ground for them, in an open situation; some good rotten dung should be dug in. Set the plants about two feet, or thirty inches apart from each other every way.

Water them as soon as they are planted; and in dry weather repeat it occasionally, till the plants have taken good root.

SOWING CAULIFLOWERS.

Cauliflower for a successional crop may be sown any time in this month on a sheltered border.

Birds being very destructive to the seeds of all the brassica tribe, it will therefore be necessary to guard against them by covering the beds with mats, or with old fishing-nets, if they can be procured, until the seeds begin to vegetate. The annexed figure represents a very good and simple scare-crow for birds. Take a long straight slender rod of hazel, or any other elastic wood, about six or eight feet long, place it in the ground in a slanting direction; from the point A drop the line B of small cord, to which at C fix a potato, which is stuck full of feathers of different colours. This will produce a simple pendulum, which is kept in motion by the wind; the potato may be suspended at about twelve or fifteen inches from the ground. This is an efficacious method of scaring away birds, and it was observed by a friend in the gardens of the late A. Bacon, Esq. of Elcot, in Berkshire.



The cauliflower-plants kept in pots during the winter may, when the weather is fine, be planted out. The ground being

dug, make holes sufficiently large for each plant to admit of a spade full or two of good rotten dung being placed in it, and upon this dung set the plants, one in each hole, at the regular distances. Turn them carefully out of the pots without disturbing the balls; if the weather be dry, settle the mould about them with a gentle watering. The pots may be left by their side, and if sharp frosts occur, cover the plants every evening by inverting the pots over them, or shelter them by placing one or two branches of spruce, or fronds of strong fern, round them. Remove these protections by degrees, as the plants get established, and the weather becomes more settled.

CAPE BROCCOLI.

The cape broccoli sown in autumn, and wintered with the cauliflowers, may now be planted, and treated in the same manner as the cauliflower. To protect them from the cold cutting winds of April, stick a few branches round each plant; this will not only break off the winds, but partially shade them until they have taken root.

SOWING BROCCOLI.

Sow a moderate quantity of early purple broccoli, early white, dwarf brown, three-headed purple broccoli, Portsmouth, sulphur-colored, cauliflower broccoli, late dwarf purple broccoli, Siberian, or Danish. Sow the seeds on a rich sheltered border, and cover them with mats, or long litter, if the weather be frosty. Should it, however, be mild and dry, give plenty of water. When the plants are two or three inches high, transplant them into rich beds four inches apart. Still continue the use of water freely, if the weather be dry; in two or three weeks, they will be fit for a second transplanting; but should any of the sorts, or all come up weakly, leave them for a longer time in the seed-bed; from which, a part may be planted out where they are to remain, in May, without being transplanted at all a second time.

SOW AND PLANT CABBAGES.

Sow and plant all sorts of cabbages, and earth up and clear from weeds the crops already planted. Take advantage of dry days to stir the surface about the stems of all the forward crops of cabbages: this will refresh and strengthen them. Prefer for this sowing the Battersea, Imperial, Antwerp, and Pentonville.

SOW SAVOYS.

Sow full crops of savoys, both at the beginning and end of the month.

BRUSSELS SPROUTS.

Sow now Brussels sprouts for a full crop. It is difficult to procure the genuine seed of the Dutch Brussels sprout, which is preferable to all other varieties, forming little close heads in spring. In Holland, and other parts of the continent, this vegetable is held in high estimation, and is sent to table during nearly ten months of the year.

SOWING BORECOLE.

Many sorts of kale are understood under the general name of borecole; the principal of which are, the green borecole, or Scotch kale, German greens, Buda kale, Woburn perennial kale, ragged Jack, purple or brown kale. For the others, see the *Systematic Catalogue*. The seeds of the two former and the two latter may now be sown on a border of middling good ground. The third, or Woburn kale, is propagated by cuttings of six or seven inches long, and planted, where they are finally to remain. By the end of this month, the crop of this kale will be exhausted, the stems may be cut down within two or three buds of the ground; which must be dug over, and afterwards kept clear of weeds.

SOWING SALSIFY, SCORZONERA, AND SKIRRETS.

Sow all these sorts about the middle of the month, in drills twelve or fifteen inches apart. Cover them slightly. As their roots are esteemed, when large, let the ground be sub-trenched, and manured with a compost of rotten dung, road-scrapings, &c. Avoid using rank dung for any sort of vegetable, the roots of which are to be used.

If the ground be dry, tread it slightly, and scatter a few lettuce-seeds thinly among them.

They will require thinning in May or June, to five or six inches distant; the roots will attain perfection in autumn, and continue good during the winter, until the following spring.

PLANTING POTATOES.

New or improved varieties of this valuable root are only to be obtained from seed, which ripens in great abundance upon the later kinds; but the earliest varieties seldom produce either flowers or seeds. Where it is intended to originate varieties from seeds, the apples as they are called, or seed-envelops, should be gathered in October when ripe, and the seeds taken out by washing the pulpy matter several times, until the seeds be left clean. They should be preserved until the spring, and sown in a light dry soil in drills, and covered to the depth of three inches; they will soon appear above ground, and, as they advance in growth, thin them out to five or six inches apart, and keep them clear of weeds till autumn, when they will be fit to take up. The first season, the tubers will be very small, though numerous; select such, whose formation appears to be most perfect for the purpose of planting the ensuing spring. At the end of the second year's growth, they will have attained a size sufficient to determine their properties; and such as appear worthy of cultivation, should be kept for planting, and the remainder thrown away. It would undoubtedly be worthy the attention of cultivators, who attempt this process, to impregnate the blossoms of one valuable sort with the farina of another; many valuable fruits have been thus produced, and

as the parts of fructification in potatoes are sufficiently large, the greater would be the probability of success.

Early potatoes from a defect in their formation, are not so capable of being thus multiplied into varieties. An experiment of Mr. Knight's, given in the Horticultural Society's Transactions, is for its ingenuity worth recording, by which he induced a state of flowering in potatoes of this sort. "I suspected the cause of the constant failure of the early potato to produce seeds, to be the preternatural early formation of the tuberous root, which draws off for its support that portion of the sap, which, in other plants of the same species, affords nutriment to the blossoms and seeds, and the experiment soon satisfied me that my conjectures were perfectly well founded. I took several methods of placing the plants to grow, in such a situation as enabled me readily to prevent the formation of tuberous roots, but the following appearing the best, it is unnecessary to trouble the society with any other. Having fixed strong stakes in the ground, I raised the mould in a heap round the bases of them, and in contact with the stakes: on the south sides I planted the potatoes from which I wished to obtain seeds. When the young plants were about four inches high, they were secured to the stakes with shreds and nails, and the mould was then washed away by a strong current of water from the bases of their stems, so that the fibrous roots only of the plants entered into the soil. The fibrous roots of this plant are perfectly distinct organs from the runners which give existence, and subsequently convey nutriment to the tuberous roots, and as the runners spring from the stems only of the plants, which are in the mode of culture I have described, placed wholly out of the soil, the formation of tuberous roots is easily prevented; and whenever this is done, numerous blossoms will soon appear, and almost every blossom will afford fruit and seeds."

From these facts, Mr. Knight considered it sufficiently proved, that the same sap gives existence alike to the tuber and the blossom and seeds, and that whenever a plant of the potato affords either seeds or blossoms, a diminution of the crop, or an increased expenditure of the riches of the soil, must necessarily take place. The practice of taking off the blossoms of those sorts which produce them, is in accordance

with this idea, and when practised, will certainly tend to increase the bulk of tubers, by diverting those juices into them, which otherwise would be expended in perfecting flowers and seeds.

In planting potatoes, much importance is attributed by some horticulturists to the size of the sets, or portions of the tuber, which are to be planted, some recommending them to be large, and others small, and many attach a degree of importance to that part of the tuber from which the best sets should be taken. According to the doctrine of Knight, small sets may be used for late crops, as the plants attain a considerable size before they begin to form tubers; whereas, for early crops, the largest tubers should be chosen; these, he affirms, not only produce stronger plants, but they will also more readily recover the injuries sustained by frosts, on the principle, that as they are fed by a copious supply of food from the larger tubers, they are the more capable of sending up vigorous shoots, to replace those, which may have been injured or destroyed by frost, or other causes. In cutting the tubers into sections or sets, the extreme or watery end should be rejected, as having a tendency to run too much to halm, and having the eyes clustered and small. The root, or dry end, should also be rejected, as being more tardy in growth, and being supposed to produce the curl from being over ripened. The middle part, therefore, of the tuber is to be preferred and divided in pieces, having each one perfect and well-formed eye or bud.

An intelligent contributor to the Gardeners' Magazine, who styles himself a Denbighshire Gardener, gives the following valuable remarks upon choosing seed-potatoes: " Preferring unripe potatoes for seed is not new in practice, it has prevailed for ages. Where do the farmers of the rich soils and warm countries send for their seed-wheat and seed-potatoes? to the cold hilly countries, where they do not one season out of three thoroughly and perfectly ripen their seed. In Denbighshire, we call the hilly, or unripe potato, the *wet* potatoes; and those from the rich soils and warm situations, where they ripen perfectly, we call the *dry* potatoes, although exactly the same varieties: the wet or unripe are reckoned the best for seed, and the dry for food. The potato tuber is a perfect organized

system, in which the circulation regularly proceeds, and if suffered to ripen, will then tend to decay; but if separated before ripe from the stem or stalk, which furnishes it with blood or fruit-sap descending from the leaves, the circulation of the blood-sap is suddenly arrested."

"The ripe potato having performed all its operations, becomes more inert, but the circulation of the sap in the unripe tuber having been stopped, it starts more readily, and with greater vigour when planted; the one seems to die, worn out with age, the other seems accidentally to have fallen asleep, and when awakened, possesses an unspent vigour and energy. This is the case not only with the potato, but also with the apple, pear, and other fruits, whose life, if I may so express it, it is desirable to prolong or extend beyond the time naturally allotted to it; they are then taken off the tree long before they are ripe, and experience has taught us, that they will keep much longer, and eat much fresher, than those suffered to grow ripe upon the tree: the same is the case with the potatoes taken up before ripe. Placing the potatoes upon the gravel, or in the sun, on any dry but not a grass walk, has the effect of stopping the circulation in the tuber, in which nature has provided resources to carry it on to an extraordinary degree, unless so stopped."

"If you will examine the potato-stem or plant, when the tubers are beginning to be formed, you will find that the potatoes are placed upon the runners pushed or issuing out from the plant or stem *above* the set. The functions of the set are to push out roots, to gather food from the soil, to supply the plant and leaves with that food, and from the leaves, the blood or fruit-sap flows down to form the runners, and new potatoes; and the more you earth up the plant or stem, the more runners are formed higher up on the stem, and the more potatoes are produced." He concludes by stating, "that earthing up the potatoes causes them to be later; and that by earthing them up after taking away a few of the earliest, also causes them to throw out more runners and produce more potatoes; the top or eye-cuts producing potatoes a fortnight earlier than the bottoms of the same tubers."

This is somewhat similar to the doctrine laid down by Mr.

Knight, which will be subsequently noticed. The same intelligent writer, in another communication in that useful periodical, supposes, that seed-potatoes from a cold and poor soil, when planted in a rich and favorable one, will hasten their maturity six weeks; he justly observes, that "obtaining a crop six weeks earlier than usual is an object deserving the highest consideration; its coming into use at the season of the year, when the poor man's garden affords him no new vegetables, when the stock of the old potatoes is become short and dear, and withal so bitter, unpalatable, and unwholesome, to have then a crop of new potatoes is a delicacy indeed, especially to the poor, depending so much for their support upon the potato; still more so to the Irish poor, to whom the potato may be said to be the staff of life."

Regarding that disease called the curl, so injurious to potato crops, he presents us with the following valuable remarks: "I have," he says, "planted several rows of early pink-eyes from ripe tubers, which are now coming up almost all curled; not a curl appears on any of the same variety from unripe tubers, although planted within a few yards of each other. The last autumn, (1826,) being warm and long, enabled the worm to grow stronger and more vigorous to attack the potato, in which it made holes, and therein perhaps deposited its eggs, which, nourished by the heat, acquired life and strength, and after the potato was planted and became soft, it grew vigorous and preyed upon its sap, rendering the plant weak and curled. I am," he says, "inclined to think that the worm is the cause of the curl, and that if potatoes, intended for sets, were taken up before being ripe, that is, before they are full grown, the worm will not have attacked them; and that if it has, exposing the potatoes to the sun will kill the worm before it has deposited any of its eggs." He concludes this paper by recommending potatoes intended for seed for the following season, to be taken up before they are fully grown, and exposed to the sun for a month or six weeks, and at the season of planting, to "observe the eye-cut, and by placing it upward, it will secure, without any further trouble or expense, a crop of every variety of potato six weeks earlier than the same variety will produce if allowed to grow to maturity."

Mr. Knight, in one of his valuable papers, in the Transactions of the Horticultural Society, says, "When the planter is anxious to obtain a crop within the least possible time, he will find the position in which the tubers are placed to vegetate by no means a point of indifference; for these being shoots or branches, which have grown thick instead of elongated, retain the disposition of branches, to propel their sap to their leading buds or points most distant from the stems of the plants of which they once formed a part. If the tubers be placed with their leading buds, a few very strong and early shoots will spring from them; but if their position be reversed, many weaker and later shoots will be produced, and not only the earliness but the quality of the produce will be much affected in size."

Ground in which potatoes are to be planted, if not in tolerable good condition, should be dunged, but when they can be grown in fresh unimpoverished soil without manure, their flavor will be better. Ground which has long lain uncropped, or that which has never been in a state of cultivation, if dry and not very barren, will produce excellent potatoes, both in quantity and quality. Leaves of trees, not too much decomposed, are good manure for this crop, and will produce both early crops, and have the least effect on their flavor. Rank and unfermented dung is the worst that can be applied.

Amongst the many curious and interesting experiments made by Mr. Knight upon this valuable vegetable, is the following: "by planting in June or July, he conceives, that an exhausted good variety may, in a great measure, be restored, by using the produce of this late planting for the seed of the succeeding season, planted at the proper time." But, with all due deference to the worthy president's theory, we have been disappointed in practice by its adoption. In 1824 and 1825, we planted several kinds of potatoes, in the beginning of July, in the open fields, which, although considered good sorts, yet had ceased, in the gardens at Stratton Park, to be good in quality. The produce of this late planting was again planted in March and April in the gardens, and we found them not improved in quality nor size, but rather progressively worse. It is, however, a matter of much importance, and the result of

similar experiments may differ in different situations. A vegetable, which constitutes no inconsiderable portion of the food of man, deserves our utmost care in its improvement, and it is to be regretted, that so few appear, in that point of view, to pay the necessary attention to it. Indeed, to Mr. Knight, in England, and Messrs. Dickson, Crichton, Young, and Shirreff, in Scotland, we are indebted principally for the improvements, which have been made in the culture of this root.

SPINACH.

Sow spinach for a successional crop, to come in, in May and June. Where a constant supply of this plant is required, sow once a fortnight, as the spring sowings soon run up to seed; the round-leaved spinach is still the proper sort to sow, either broad-cast and raked in, or in shallow drills, or in drills between the crops of peas, beans, and such like crops; the shade afforded by them will prolong the season of the spinach.

Hoe the spinach which was sown in the former month, especially the broad-cast sowings: and thin the plants out to three, four, or five inches distant.

SOWING BEET.

Beet for a full crop should now be sown; the ground should be sub-trenched, which will prevent the roots from forking. Sow in drills twelve inches apart, and moderately thin; cover lightly; and, if the ground be dry, tread the whole slightly. The true blood-red is the sort most esteemed for its roots; the other sorts should also now be sown.

The white beet is cultivated as a substitute for spinach. The great white or sweet beet is cultivated for the midribs and stalks, which are separated from the lamina of the leaf, and are stewed and eaten like asparagus under the name of chard. This sort is much more esteemed and cultivated on the continent than in this country.

The sort called mangel-root (*mangel-würzel* of the Germans) is a valuable agricultural root for feeding cattle, and affords, equally with all the others, a considerable quantity of

sugar. It is seldom cultivated in the gardens. In dry seasons, beets are liable to be destroyed by the turnip-fly; it is therefore advisable to sow a small bed or two in different parts of the garden, partially shaded. If the general crop fail, then it may be made good by transplanting those from the seed-beds. This should, however, be done carefully, as the roots are liable to be destroyed in taking up. The mangel-wurzel we would particularly recommend to the attention of cottagers; it will grow in almost any situation, and if reared on a small seed-bed will be fit to transplant on the same ground that has been occupied by early potatoes, peas, or such like crops. It will be extremely useful to those who keep a cow, giving to the animal three or four roots twice a day, according to their size; some pigs are remarkably fond of it, and when boiled few will refuse to eat it.

The seeds of the true red beet are difficult to procure; when therefore a gardener succeeds in obtaining a few good roots, he should be careful to propagate it by seed. In doing so, let it be planted remote from all other beets, to guard against their being impregnated with any other sort.

SOWING CAPSICUMS.

Capsicums are used either for pickling or preserving, and may be sown in any kind of forcing-house, or in a hot-bed, in a pot or box filled with fine light mould. Having attained to the height of about two inches, it will be proper to plant them in small pots, and afterwards to replot them, and place them in a forcing-house; they may then be planted out in June in a warm sheltered situation. They may also be planted at this time in the border of any kind of forcing-house, where they are not much shaded, and have ample room to grow; the culture of them is simple, according to either of these methods. They require a light earth, but not excessively rich, and to be pretty freely supplied with water; or they may be sown in the open air, where, in favorable situations, they will come to maturity.

SOWING CARROT.

Carrots should now be sown; the sorts are, the orange, long red, and the Alteringham, which is an excellent sort originally from Cheshire; the orange is also a good sort; the long red is generally cultivated in fields for cattle, and in farmers' gardens, for colouring butter. The seeds have numerous forked hairs on their borders, by which they adhere, and therefore, previously to sowing, they should be well rubbed between the hands, and mixed with dry sand, in order to separate them as much as possible; they are also very light, and therefore a quiet still day should be chosen for sowing. The seeds should be trodden in after sown, previously to being raked in. The ground should be deep dug, or half-trenched and drilled in rows, twelve or fourteen inches apart. In strong stiff soils, cover the seeds in the drills with vegetable mould, or any other light dry mould, most conveniently at hand.

As the young plants are liable to be destroyed by insects, the better practice is to sow thick. The middle of May is a good time to sow carrots, as by that time, the grubs will have attained their fly-state before the plants come up. In sowing all general crops, it is advisable to sow at two or even three different times, so that if one crop be destroyed, another may succeed.

SOWING PARSNEPS.

A full crop of parsneps should now be sown, if not done in March.

TRANSPLANTING CELERY.

The celery-plants, which were sown in February or March, for an early crop, will be fit to prick out about the middle or latter end of this month, into a nursery-bed of rich light earth.

Prepare for this purpose a piece of rich ground, form it into beds, and rake the surface even; then thin out a number of the best plants from the seed-bed, and plant them into the above, at about three inches apart every way; then give a

moderate watering, and repeat it occasionally till the plants have taken fresh root. The ground for this purpose cannot be too well manured, and if they be pricked out into rotten dung alone, they will be the stronger.

The plants should continue in the beds a month, at least, to gain strength before they are planted out finally into the trenches.

As these early sown plants, after they are fit for use, will not remain long before they run up to seed, a great number of them should not be planted out.

Sow some celery-seed, in the first or second week of this month, to raise plants for succeeding those, which were sown in March.

Dig for this purpose a bed of rich light earth, and make the surface smooth; sow the seed thereon tolerably thick; and either rake it in gently, or otherwise cover it about a quarter of an inch with fine earth, and, in dry weather, give moderate waterings, both before and after the seed comes up.

CELERIAC.

Celeriac sown last month, when fit to be transplanted, should be done on a bed of light rich mould, and abundantly supplied with water.

SPRING-DRESSING ARTICHOKEs.

For directions, see *March*.

SOWING LEEKS.

If a full crop of leeks were not sown last month, let that be done without delay.

ASPARAGUS.

If the state of the weather, or any other circumstance, have hitherto prevented the asparagus-beds being dressed, and young beds made, and sown, let that now be done. For full directions, see *March*.

LETTUCES.

Continue to sow and transplant lettuces of all sorts; the better the ground, the more luxuriant will be their growth. Sow each sort separately, and in transplanting set the plants from ten to twelve inches apart, after which, water them occasionally till they have taken root. Repeat the sowings and plantings once every fortnight, or three weeks, that a regular supply may be obtained.

RADISHES.

Sow radishes of different sorts every week during the summer. They may be sown in drills between lines of peas, or on spare borders where they are partially shaded. Give plenty of water in dry weather: if this be not attended to, they will be hard and unfit for use. Thin the crops already sown, each from two to three inches apart.

SMALL SALADING.

Sow small salading about once every week or fortnight; the sorts are cresses, mustard, rape, &c.

Dig a bed of light mellow earth for these seeds, and rake the surface fine. Draw some flat shallow drills, sow the seeds therein, each kind separate, and cover them lightly with earth.

Water them moderately, if the weather should be dry, which will greatly promote their growth. If those in the open ground be attacked with hoary morning frost, and a sunny day succeed, water the frost off before the sun shines strong upon them.

SOWING NASTURTIUMS.

Sow nasturtium-seed: draw a drill or drills, about an inch deep and a yard asunder, or a single drill under any fence, &c. on which to train the plants in their running growth; sow the seed moderately thin, and cover it in regularly.

PURSLANE.

Purslane may be sown now, if warm dry weather, on a bed of light rich earth, in the common ground. Sow it either in drills six inches asunder, or on the surface, and rake it in lightly and regularly. Water the bed often in dry weather, and shade it from the hot sun till the plants have acquired a little strength.

But if cold or very wet weather, sow some either in a hot-bed, under the shelter of glasses, or in a warm dry border and defended from cold, &c. This plant is by many people much esteemed in summer salads.

SOWING ONIONS.

Where circumstances prevented the principal crops of onions from being sown last month, let that now be done; for the distance between the drills, and preparation of the ground, see *March*. However, in strong wet soils, onions may be still sown with better success, than if sown earlier, particularly if the ground were wet.

TRANSPLANTING ONIONS.

Onions may be successfully transplanted, particularly the crops sown in autumn. Prepare a piece of ground moderately rich, which has been well manured for the preceding crop. Let it be well dug, and rendered fine with the spade. As the process of digging is carried on, draw drills an inch and a half deep, and twelve inches apart. Having drawn the first drill, proceed to draw from the autumn crop, a sufficient number of plants, so as to leave a crop on the ground; let them be drawn carefully. If the ground be hard, loosen the whole; this will not only enable you to thin out the crop, without injuring the plants, but will materially promote the growth of those which remain. Having drawn a number sufficient to plant one drill, proceed to lay them regularly into the same, observing not to cover the bulb of them too much. The fibrous roots are all that ought to be covered, and this should be done to the thick-

ness of an inch and a half. Press the mould which covers them gently down with the back of a spade, and give them a gentle watering over head; prefer to cover with light sandy loam or vegetable mould. In a few days, if showery weather intervene, the whole crop will take root in the ground. If the weather be dry, let them be watered every afternoon, with a strong garden engine, which can be done without treading the ground. Onions sown on slight hot-beds may be transplanted in the same manner.

Transplanting onions is by no means a new feature in gardening. The Neat-House gardeners of Battersea, adopted this practice at a very early period, and it was not unknown to the cottagers in many parts of England. It has, however, been revived by Knight, Warre, M'Donald and others, and deserves to be more generally adopted. Knight's opinion is, that "Every bulbous-rooted plant, and indeed every plant which produces leaves, and lives longer than one year, generates in one season, the sap or vegetable blood which composes the leaves and roots of the succeeding spring; and when the sap has accumulated during one or more seasons, it is ultimately expended in the production of blossoms and seeds. This reserved sap is deposited in and composes in a great measure the bulb; and moreover, the quantity accumulated, as well as the period required for its accumulation, vary greatly in the same species of plant, under more or less favourable circumstances."

"Thus the onion, in the south of Europe, acquires a much larger size in a single season, than in the colder climate of England; but under the following mode of culture, two summers in England produce nearly the effect of one in the southern parts of Europe, and the onion assumes nearly the form and size of those thence imported. Spanish or Portuguese onions are sown at the usual period in the spring, very thick, and in poor soil, generally under the shade of a fruit-tree; and in such situations, the bulbs in the autumn are rarely found much to exceed the size of a large pea. These are then taken from the ground, and preserved till the succeeding spring, when they are planted at equal distances from each other, and they afford plants possessing much greater

strength and vigour than those raised immediately from seed. The bulbs, thus raised, often exceed five inches in diameter, and being more mature, preserve through the winter a perfect soundness."

SOWING FRENCH BEANS.

At the beginning of the month, French beans may be sown in a light, rich, warm border, and towards the close of the month, they may be sown on a more open spot of ground. By the adoption of this plan, a regular succession of crop will be obtained. In the first sowing, we would recommend the speckled dwarf; and for the latter sowing, the negro, Battersea, or the liver-colored; they must be sown in drills about two feet apart, and two inches deep, or the beans may be dropped in by the hand at an inch distant; the effect of this will be, that a more even crop will be obtained; they should also be sown in dry weather, as wet is apt to destroy the seeds in the ground. Do not tread the ground, but cover and dress it with the rake.

If it be required to have a very early crop of French beans, it will be necessary to sow them in pots or boxes, and placed in the hot-house, or in a hot-bed. The seed may thus be sown about the beginning of the month, and when arrived at a proper size may be planted out in fine rich earth at the bottom of a wall or hedge, having a southern aspect. If the plants be set in single lines, they must be planted at three inches distant; but if in double lines, about a foot apart, and at four or five inches distant in the line; the plants will thereby be kept as near as possible to the wall or hedge, and reap the full benefit of its shelter. Particular care must be taken not to plant too deep, and after every planting to give a little water.

Scarlet runners may now be sown; and if another crop be sown in July, it will tend to prolong the season of French beans to the very latest, as they will continue bearing until they be destroyed by the frost. For the latter purpose, the white runners are equally good.

The climbing sorts of French beans are not so hardy as the dwarfs, therefore only a few should be sown, unless the wea-

ther be fine. The beginning of next month will be time enough for full crops. They should be allowed four feet between the rows, as they grow very tall, and four inches apart in the lines.

SOWING TURNIP.

Turnip, to succeed those sown last month, should be sown at the beginning, middle, and end of the month, either in drills an inch deep, or broad-cast thinly. Sow the early stone, or the early white Dutch. They may be sown between crops of peas, asparagus, or sea-kale, provided the soil be light. Refresh plentifully with water, and sprinkle a little wood-ashes, if the fly make its appearance. Keep them clear of weeds, and ultimately thin them out to three or four inches apart.

LOVE-APPLES.

Sow love-apples for their fruit to pickle, and for soups, &c., if omitted last month; this is still a proper season for that work, sowing them in a hot-bed, as directed in March.

SOWING AND PLANTING SEA-KALE.

This plant is indigenous to many of our sea-shores, growing in fine drifted sand, sometimes covered partially with small stones and gravel. In light sandy garden-soils, it comes to perfection with little care, but in strong clayey soils it is often apt to rot in winter. In preparing ground for sea-kale, if the ground be naturally strong, it should be trenched to the depth of three feet, if it will admit of that depth, and well manured. Divide the ground into four-foot beds, with alleys eighteen inches wide; throw out the mould of the alleys to the depth of ten or twelve inches, which mould being laid on the beds, will raise them from fifteen to eighteen inches above the bottom of the alleys, which will render the beds dry. If the ground be particularly stiff, lay on a quantity of fine sharp sand, which, if properly mixed in the process of trenching, will render the beds sufficiently light for the cultivation of this excel-

lent vegetable. About the middle of this month, if the beds be prepared as above, proceed to draw two drills in each bed, about two inches deep, in which the seeds must be sown. Sow moderately thick, so as to secure a crop, which afterwards will be thinned out to twelve inches apart. The turnip-fly and wire-worm are great enemies to all the plants of the class *Tetradynamia*. The best remedy for the latter, is to have them picked out of the ground by the hand; the former may be prevented from doing much injury, by a circle of quick-lime strewed round the plants.

Sea-kale may be cultivated by rearing the plants from seed on a seed-bed, and, when a year old, transplanting them into beds prepared as above, at the distance of eighteen inches each way; but in setting young plants, place them in patches of three plants each, taking care, in removing them from the seed-bed not to injure the tap-roots. Sea-kale plants of a proper age may be had of most nurserymen, but, in well regulated gardens, a part should be annually sown, so as to have a supply always at hand. However, where circumstances will admit, we would advise to sow the seeds in the beds, where they are to remain to come to perfection. This is attended with much less trouble, and if the beds have been properly prepared, the plants will become stronger than those which have been transplanted.

Sea-kale is propagated by some of the most eminent gardeners in the vicinity of London, by cutting the roots of the old plants into pieces about an inch long, and planting them in drills like potatoes. By this means, the buds will spring and find their way to the surface with greater certainty than if planted by the dibble; by which latter process, many of them run a chance of being placed with their root-end uppermost, and consequently be unproductive of shoots.

BLANCHING SEA-KALE.

The sprouts which rise at this time, and in May, being properly blanched, are held in high estimation. The process of blanching is performed in a variety of ways. The most convenient and the best for sea-kale, which is not forced, is to

cover the beds in autumn with leaves raked up from the woods or pleasure-ground, covering each bed in thickness according to the strength and age of the plants, giving the greatest covering to the oldest or strongest roots. The covering may be from five inches to fifteen when first laid on, and over that, place a slight covering of light littery dung, to prevent the leaves from blowing about; this covering is to remain on until the crop be all cut, when it may be taken away, and the beds dug over, or when, from particular circumstances, this has not been attended to in autumn, as at this time the buds begin to appear, fork the beds regularly over, and cover the plants from twelve to fifteen or eighteen inches with saw-dust, or rotten tan, when it can be conveniently procured; if neither can be had, break the mould on the surface of the beds as fine as possible, and mould up the plants with it. But where there are blanching-pots used for the crops of sea-kale, which have been forcing during the winter, they may be used with propriety to blanch the spring crops, as they will now be useless in the forcing department. Place them over the plants, and draw a sufficient quantity of mould round their base to prevent the admission of air. The action of the rays of the sun penetrating through the pots will, in a considerable measure, accelerate their growth. Large flower-pots turned down upon them will answer the purpose, provided the holes in the bottom of the pots be stopped; the plants will draw sufficient air for their sustenance, however well the holes may be stopped. For blanching sea-kale, see further in the *Forcing-garden*.

When the young stems are about three or four inches high, remove the leaves where they have been used, carefully with a fork, and cut them off, but so as not to injure the remaining buds, which are springing from the same root.

A succession of gatherings may be continued for five or six weeks, after which period, the plants should be uncovered and their leaves suffered to grow, that they may acquire and return a sufficient quantity of nutriment to the roots for the next year's buds. The flowers, when the seeds are not wanted, ought to be nipped off with the finger and thumb as long as they appear, as they tend considerably to weaken the plants.

SOWING CARAWAY AND FENNEL.

Sow a small quantity of each of these on a light rich border; a small spot will produce enough for an ordinary family.

SOWING AND PLANTING MARJORAM.

During the whole of this month, marjoram may be sown on a bed of light earth, and may be afterwards transplanted into rows nine or ten inches distant, and about three or four in the line. If it be required to have an early supply of knotted or sweet marjoram, a little may be sown about the beginning of the month, and be covered with a hand or bell-glass, for the purpose of bringing it forward. Pot-marjoram may be easily raised by slips taken from the roots.

SOWING BASIL.

The directions already given for marjoram are applicable to this plant; or a little seed may be sown in a flat box, or pot, placed in any of the forcing-houses, and afterwards transplanted.

PLANTING MINT.

Sweet mint, or spear mint, is generally raised by slips of the root, and may be either planted closely in a bed, or in lines six or eight inches distant. It is a herb, which will thrive in almost all soils, but flourishes best in a light moorish earth. A few rows, or a small bed, are sufficient for a middling-sized family.

If it be wanted early for house-lamb, the roots should be covered with a hand-glass about the beginning of February, which will considerably advance its growth.

SOWING BORAGE AND MARIGOLD.

Sow in every respect as directed above for caraway and fennel.

PLANTING SAGE.

This herb may be propagated either by cuttings, or by slips off the root. This is the proper season for propagating it by slips, but the end of July, or the beginning of August, is the most seasonable time for its propagation by cuttings. Although they will thrive in almost any soil, yet a light soil is preferable; wet ground is by no means congenial to them, as in winter they often perish in it: a few slips will be sufficient, if wanted only in the green state; but, if it be wanted to dry for winter use, a greater number will be required. Two kinds are used in the kitchen, the green and the purple; the variegated sorts are reckoned ornamental plants, and seldom cultivated for the kitchen.

PROPAGATING MEDICINAL PLANTS.

This is a proper time for sowing, or otherwise propagating all medicinal plants, such as angelica, hyssop, lavender, rue, wormwood, rosemary, balm, scurvy-grass, myrrh, burnet, &c.

SOWING AND PLANTING THYME.

This herb may also be propagated either by seed or from slips. The seed should be sown on a light soil, and when the plants are about two inches high, they may be planted out in lines, about nine inches asunder, or the slips may be planted at the same distance; the seedlings may be thinned out, without transplanting, to about six inches square.

PLANTING TANSY.

This herb will thrive in almost any soil, and may be propagated by slips off the root; very few will suffice, and if they be planted in patches, sufficient space must be given them to bush: but if they be planted in a row, the sets must be placed twelve or fifteen inches distant.

SOWING AND PLANTING SAVORY.

The same directions will apply for the propagation of savory as those which have been given for marjoram. If the sweet sort be wanted at an early period, it may be brought forward by placing hand-glasses over the roots, or by planting the slips in a frame with lights. Winter savory may also be propagated in the same manner by slips.

PLANTING TARRAGON.

There are three methods of raising this herb, either by slips, cuttings, or seed; if the former be adopted, less space will be required, and it will succeed, if the cuttings be made in August. A wet soil does not suit it; it is apt to perish in it in the course of the winter.

GOURDS AND PUMPKINS.

The fruit of these plants being used when young, and in their more advanced and mature growth for culinary use, a few may be raised for that purpose.

They are only propagated by seeds, which should be sown in pots or shallow pans, in any light rich mould, and placed in a melon or cucumber-frame to forward their growth; or where many are wanted to be raised for planting out in the pleasure-garden, or for training on walls or fences, or for hiding any disagreeable object, for which, from their rapid growth and large leaves, they are admirably calculated, they may be transplanted, when in their rough leaf, into pots of the size called thirty-two's, one plant in each, and forwarded on a slight hot-bed. When fully established, air should be freely admitted every day, so as to inure them by degrees to meet their final transplantation in May. If the seeds be sown as above directed about the middle of the month, they will be in a proper state for transplantation about the end of May, which is as soon as they can be planted out with safety. The more curious sorts, either for their size or singular forms, will

ripen their fruit in most seasons, if sown on a slight ridge of hot dung, and left to grow to maturity where they are sown, if only covered with hand or bell-glasses; but this mode of culture is only applicable to situations, where neatness is less attended to than convenience. In whatever situation they may be planted, it is necessary that they be set in a rich compost, three-fourths of which should be rotten dung.

DESTROY SLUGS, &c.

When slugs, caterpillars, &c. begin to appear, turn young ducks into the garden, once or twice a week; but never let them remain longer than two or three days at a time, as they soon tire of their food, or become indolent from satiety. While in the garden, they should have no food given them; but a little water is very necessary, if there be none in the garden.

But the most effectual method of preventing the ravages of the slugs, is to have them gathered by the hand every morning, as long as they appear numerous, carefully looking over those crops to which they are the most attached. If this method be slow, it is nevertheless sure. The market-gardeners in the vicinity of London scatter the leaves of cabbages, or lay patches of straw upon the ground, under which the slugs retreat in the morning before the effects of the sun are too powerful for them; these leaves, or straw, are examined during the day, and all the slugs are either gathered and destroyed, or are well sprinkled with lime water, which is certain to kill them.

WORK TO BE DONE IN THE CULINARY GARDEN.

Let all the walks in, and connected with the kitchen-garden be now laid down, if not done in March; nothing gives a garden a neater appearance than the walks being kept in good order. Let all the coverings that may have been used to protect either winter or early spring crops be now cleared away. Rough dig all vacant ground, and hoe and rake all the small borders. Use the hoe freely among crops of winter onions, spinach, &c. Destroy all weeds as they appear, particularly

the various species of *Veronica*, and other early annuals, which, if not attended to, would spill their seeds on the ground, and produce them in a thousand fold. Have all roots, docks, dandelions, and similar weeds, carefully dug up with a fork, and immediately carried off in a basket to the woods. Let order and neatness be your constant aim. The garden, although appropriated solely to the culture of culinary vegetables, and not flowers, is not to be kept, like the garden of the sluggard, overgrown with briars and thistles. See every evening that all the tools used throughout the day have been carefully removed to the tool-shed. Nothing indicates carelessness more than seeing tools left in all directions, independently of the confusion which it makes, when they may be wanted on the morrow. Be careful to destroy all snails and slugs, which at this season are invited abroad by the gentle showers of rain peculiar to the season, for if they be suffered to increase, they will become very troublesome and destructive to many of the crops.

After a shower of rain draw the earth up to the stems of cabbages and cauliflower-plants, which were planted either in autumn or early in the spring. This is absolutely necessary, to guard their stems from the sun and wind, which dry and harden them; but, in performing this operation, care must be taken not to draw the earth up into their hearts, which will destroy them. Hoeing at this season not only gives a neat appearance to the surface, but also promotes vegetation in the plants, and in dry weather prevents the too rapid evaporation of the moisture in the soil. As the operation of hoeing proceeds, let the whole be neatly raked over, which will destroy **those weeds which the hoe may have left.**

M A Y.

PLANTING BEANS.

Plant Windsor, Toker, or Sandwich beans, in lines three feet apart; or the long-pod and white-blossomed will succeed equally well. If they be planted three feet apart, a row of savoys, cabbages, or broccoli, may be set between them, when these plants are strong enough to plant out; or, if they be four feet apart, then two rows of either of them may be planted between them, which will turn the whole of the ground to the best account. If a supply of young beans be wanted, it will be advisable to plant them at the beginning, middle, and end of the month. If there be choice of soil, allow them rather a damp situation at this season. Hoe and earth up the crops of beans already above ground, and keep the whole clear of weeds.

It will be proper to top those beans which are in flower, in order to promote the free setting of the pods. This should be particularly attended to in the early crops, for it will not only make them swell faster, but will forward them into fruit at least a week sooner than those which are allowed to run; for, having no advancing top to nourish, their whole strength goes to the nourishment of the fruit. Observe to let the stems be first advanced to such a height, as to have a sufficient quantity of pods; the early mazagan may be topped when about two feet high, and the larger sorts when from two feet and a half to three feet or three feet and a half high.

SOWING PEAS.

To have a regular supply, let some be sown at least twice in this month; but where constant supplies of young peas are wanted, three or four sowings will not be too often, and there will be the greater chance of success in the late sowing. It is good practice not to sow in too large quantities at any season; the better plan is to sow oftener, and to use a variety of sorts,

so that when one crop is exhausted, another will be ready to succeed it.

The best sorts to sow at this time are the marrowfats, particularly Knight's tall marrow, which, if sown in good ground, will yield abundantly, and the dwarf green imperial marrowfat; also the Spanish moratto, green and white rouncivals, being fine large sorts; likewise any of the hotspur kinds, and Prussian peas. Those that are sown any time in this month will yield tolerably good crops toward the latter end of July, and in August.

This is now a proper time to sow dwarf peas. These sorts seldom grow above two or three feet high; some not above fifteen or eighteen inches, but are mostly great bearers; the pods small but numerous, and the peas, while young, eat sweet and good; those sown at this season will generally be more productive than the larger kinds, although it be not so advisable to sow in large quantities for any principal crops. Sow them in drills two feet or two and a half apart.

Hoe, and let some earth be drawn up about the stems of the crops of peas which were sown in April, for this will strengthen the plants considerably. The early hotspur peas now in blossom, in warm borders, may be topped, as directed for beans; it will cause the pods to set and swell more freely, and will be fit to gather sooner.

STICKING PEAS.

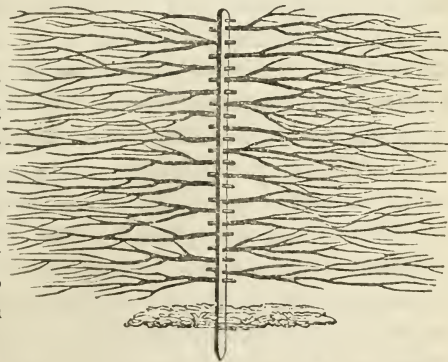
Place sticks to rows of peas, according to the growth of the different young crops, for the plants to climb upon; this should generally be done when they are about six or seven inches high.

A great advantage is derived from allowing sticks of a proper height, for the different sorts of peas to climb upon; for the produce is generally not only much superior, but more abundant, often even double the quantity, or more, than from those that are permitted to run upon the ground.

The sticks for this purpose should be from four or five to seven feet high, according to the growth of the different sorts of peas; they should also be well furnished with small lateral

branches, that the plants may readily take hold without falling on the ground, and they should be prepared in a fanned manner, so that the side branches extend only the way of the rows; for this purpose, no wood is so good as beech-branches, as they naturally spread out like a fan. Some advise that they should be placed on the most sunny side of the rows; at least towards the east or mid-day sun, where the position or range of the rows admits; for the sun will naturally incline the plants that way, and they will more readily catch the sticks, which should be placed at such distances in the rows that the branches of each other may meet. Others place a row of stakes upon both sides of the row, and by this means the straw is better kept up than when only one row is used.

The difficulty of procuring sticks for Knight's marrow pea, has deterred many persons from cultivating that excellent vegetable. An anonymous correspondent, however, in the *Gardeners' Magazine*, considers that he has superseded that difficulty by the following invention, which consists of an upright stake, or standard of oak, three inches by one and a half inch, and about seven and a half feet long. Holes are bored through this stake with a half-inch auger, about three inches distant. Some good branching pea-sticks are then procured, from three feet to five feet long, and beginning at one side at bottom, are placed in the holes in such a way as to make them touch and form a complete fan. The oaken standard, when complete, shows sufficient pea-sticks for eight or nine feet length of row, six feet high. It is driven about eighteen inches into the ground, so as not to be shaken nor moved by the wind.



The sticks generally used are elm, but hazel, or any other which is spreading, with small twigs or sprays will do equally well.

STOPPING PEAS.

Stop the leading shoots of the most early crops when in blossom, which accelerates the setting and maturity of the fruit: this diverts the growth into the pods just forming, and forwards them in a considerable degree. The time for stopping is just when the flowers on the lower part of the stalk begin to fade. The plants need not be shortened more than an inch or two. This is only applicable to early crops. It would be an endless task upon a large scale, although, to a certain extent, it would be beneficial to all.

SOWING AND PLANTING CAULIFLOWER.

Towards the latter end of this month, cauliflower may be sown for a late, or for a last crop of the season, on a free open spot of light earth. The crop for a winter supply is to be raised from this sowing, and proper attention should be paid to give them a regular supply of water, accordingly as the state of the weather may require it. If the weather be very dry and the sun powerful, an occasional shading will be beneficial, so that the plants may be kept growing at as rapid a rate as possible. This is of much importance to the whole of the brassica tribe, particularly so to cauliflower and the varieties of broccoli, as, in a great measure, we thereby prevent them from running into seed, or, as it is technically called, buttoning. Cauliflower may now be planted out on a north border for a successional crop; or in a shaded spot, where they will not be exposed to the full power of the sun; the coldest and dampest situations in the garden will be the most useful for such crops at this season, as they will not thrive well if planted in an open place.

At this time, the crops which were formerly planted should be hoed and earthed up, according to the directions given last month; paying proper attention, at the same time, to those which are under hand-glasses, in regard to air and water.

Examine the early crop, and if on any of them the flower begins to appear, it will be proper to break a leaf or two upon

it, for the purpose of shading it from the sun, and at the same time of defending it from the rain. By this means, the flower is not only blanched, but its delicacy is increased. This examination of the plants should be frequently attended to, not only with the early but also with the late crops; for, by adhering to the system of breaking down the leaves on the flower, the blowing of it is considerably retarded in hot weather. The crops should be freely watered in dry weather, and a basin should be formed for the purpose of retaining the water round the roots of the plants.

SOWING BROCCOLI.

Broccoli a full crop should now be sown on a rich spot. Sow each sort separately, and attend in dry weather to water them freely. The sorts recommended for last month are now also to be sown, to which may be added the purple Cape, green Cape, Grange's early cauliflower broccoli. The white broccolis are supposed to be less alkaliescent than the purple, and therefore are by many preferred.

PLANTING BROCCOLI.

Those broccoli-plants which are fit, should now be planted out at the distance of two feet each way. Let the ground be well prepared, by giving it a large proportion of manure, and digging it well. In planting, take especial care not to bury the hearts of the plants. If the weather be dry, give a good watering, and occasionally repeat it, till the plants have taken root.

It is often the case, that old gardens are infested with an insect, which insinuates itself into the roots of the brassica tribe, and causes the well-known disease called by gardeners the *club*. The only means of getting rid of this destructive disease, is by removing the cause; and this is to be effected by trenching the ground three feet deep or more, if possible, thereby burying the insect and its eggs beyond the possibility of its soon returning to the surface. Where this mode cannot

be effected, the evil may be partly cured by bringing in a quantity of fresh loam from a common or field, and digging it in; this will greatly benefit the broccoli, and be of much service to succeeding crops. A proper attention to a rotation of crop will also go far to eradicate this evil.

In planting broccoli, as well as all the other plants of the brassica tribe, avoid, if possible, planting upon ground which has been under the same crop the preceding season.

In a communication in the Horticultural Society's Transactions, by Mr. M'Leod, Cape broccoli is recommended to be grown without transplanting, and the success of this plan has been proved to be most complete. In the end of May, the ground is prepared and firmly trodden, the seeds are then dropped in, in rows two feet apart, and three or four seeds are put into each hole. When the seeds vegetate, they are all destroyed, excepting the strongest, which are protected from the fly by sprinkling a little soot on the ground. During the time the plants are advancing, the ground is frequently stirred with the hoe, and the plants are only once earthed up during their growth. Broccoli of a great size, cultivated in this way, has been exhibited before the society, and the same mode of culture is recommended by Mr. M'Leod as applicable to spring-sown cauliflower, lettuces, and many other vegetables, avoiding transplanting as much as possible. In this we perfectly concur with him, having experienced the advantage of obtaining better and more certain crops of lettuces, and many other summer crops of vegetables, when matured upon the spot where they were sown. Transplanting during the summer months, when plants are in an active state of growth, obviously gives a check to vegetation; and it is an established doctrine amongst gardeners, that such checks tend to produce a disposition, not only in annual vegetables but in fruit-trees also, to attain a state of maturity much sooner than those which have experienced no such check. The longer, therefore, that such crops as broccoli can be kept growing freely, the finer will their produce be.

CABBAGES.

Transplant spring-sown cabbage of all sorts for autumn and winter use.

An open situation should be allotted to them; however some may be planted between rows of early cauliflowers, or wide rows of garden or French-beans.

But where there is ground to spare, it will be more advantageous to plant these crops in an open compartment by themselves. Plant them out, if possible, in moist weather, in row two feet or two and a half apart, and about two feet distant in the lines: as soon as they are planted, give each a little water.

Earth up the early and general crops of cabbages as they advance, and if the weather be dry, give occasional waterings. The early crops will now be advancing to maturity, and may be forwarded in cabbaging, if the leaves be tied together with strings of matting or willow twigs. This should be done when the leaves begin to turn inwards. Such as have run to seed should be pulled up; nevertheless any that show signs of superior qualities, either of being more early or better formed than the others, should be allowed to stand and preserved for seed. It is only by making observations of this kind, that any expectation can be formed of procuring improved vegetables.

Sow sugar-loaf cabbage-seed, and any other close quick-hearting kinds, for summer and autumn coleworts, and young autumn cabbages.

BORECOLE.

Sow borecole for next autumn, winter, and spring use, if not done in March and April.

This is a useful plant, of the open cabbage tribe, and very well worth raising in every kitchen-garden, for the service of a family. There are many sorts, none of which form close heads like the common cabbage or savoy, but always remain open and loose in the heart; but they have, nevertheless, great merit for their extreme hardiness to endure cold, and are excellent for winter and spring use.

Some of these plants run up with long stems, from two to three or four feet high, crowned by a large, spreading, bushy head of thick, fimbriated, curly leaves. They are very hardy, and capable of standing almost the severest winters. In the months of February and March, their long stems will be very productive from the bottom to the top in numerous fine young sprouts; all of which, as well as the principal head, boil remarkably green and tender.

The seed must be sown the first week in the month: but, in order to obtain strong, full-grown plants, with large stocky heads, and strong stems to produce a large supply of sprouts, a first crop should be sown in March or April, as directed in those months.

In dry weather, give the bed now and then a moderate watering. The plants will be large enough to plant out in about six weeks after the seed is sown; but when they have two or three leaves, thin and prick out a number from the seed-bed four inches distant, that they may attain a proper size for final transplanting.

Those planted out finally in June, July, and August, will produce large heads fit to cut in October, November, or any time during the winter, till the following spring.

Several sorts of borecole are cultivated by the cottagers and farmers in the north, particularly the Scotch kale, purple, or brown kale, German greens or curlies, all of which are extremely hardy. It is greatly to be desired that the peasantry of England would cultivate them more generally, as they would afford an excellent vegetable in winter and spring, particularly in those counties where much animal food is eaten. They may be planted on ground that has been occupied by early crops of peas, potatoes, or such like crops; or may be planted between rows of late peas, scarlet runners, &c., and will therefore occupy the ground when these latter crops have been removed.

SOWING AND PLANTING BRUSSELS-SPROUTS.

The directions for broccoli will apply to the sowing and planting of Brussels-sprouts; the seed may now be sown, or the plants pricked out.

SOWING AND PLANTING SAVOYS.

Savoys of different sorts may now be both sown or planted, as directed for Brussels-sprouts.

SALSAFY, SCORZONERA, AND SKIRRETS.

Salsafy, scorzonera, and skirrets, may yet be sown, if not done in April; but sow as early in the month as possible.

The early crops that are above the ground should be first thinned to two inches apart, and about the end of the month, or beginning of June, finally to four inches.

PLANTING ARTICHOKEs.

About the beginning or the middle of this month, artichokes for a late crop may be planted. See *March*, for the method of planting them. During the first week or two, let them have, if the weather be dry, a plentiful supply of water. The heads of these plants will come in late in the season, and will continue to yield their produce until the frost destroys them.

ASPARAGUS.

Asparagus will now be fit to cut for use.

The shoots of these plants, when they are advanced about two or three inches above ground, are fit for gathering while the top bud or head remains compact, but which, if permitted to run, soon becomes open, loose, and of less estimation.

When proceeding to cut them, be careful to thrust the knife down close by the side of the shoots intended to be cut, lest you wound or destroy the young buds that are coming up in succession, and do not yet appear; cutting the shoots off slanting, about three or four inches within the ground.

Let the beds be now carefully cleaned from weeds: either give a careful hand-weeding; or, with a small hoe, on a dry day, cut up all weeds clean within the surface.

Few attempts at blanching the tops of asparagus have been made in this country, otherwise than by having an abundance of loose earth on the surface, through which they spring; but Lasteyrie informs us (*Col. de Machines*) that joints of cane are placed separately over each stalk in Spain; and Bauman, of Vienna, in a communication to the Horticultural Society, on the culture of asparagus in Austria, says, "to give asparagus-shoots, growing in the open air, as much length and tenderness as possible, there is inserted over each stem destined to be gathered, as soon as it shoots above ground, a wooden tube or pipe eighteen inches high, and one inch in diameter. (Hort. Trans. vol. iii. 34.) We have practised, for the last two years, covering a part of the asparagus-beds with rotten tan, or sawdust, which has answered the purpose tolerably well. But as this vegetable is not generally preferred in a blanched state, this practice is not likely to become general.

LAYING DOWN WINTER ONIONS.

Examine the winter crop, and wherever the onions are shooting for seed, pick out their heart-buds. Remove all weeds from amongst them, and then lay down the crop, which is done by bending the stems down flat, just above the bulb. This operation may be performed by the hand, but much time is saved, by two persons with a pole or the handle of a rake, each holding one of the ends, in such a manner as, when walking up the alleys, to strike the stems about an inch or two above the bulb. This process, which is called "laying over," is of great benefit to all crops of onions, as the growth of the stem is thereby considerably checked, and the whole nourishment thrown into the bulb. It is particularly beneficial to the late crops in bad seasons, for a stop is thereby put to the luxuriance of their growth, and are, consequently, in a great degree, obliged to ripen.

GENERAL CROPS OF ONIONS.

The general crops of onions should, towards the middle or end of the month, be cleared from weeds. This operation

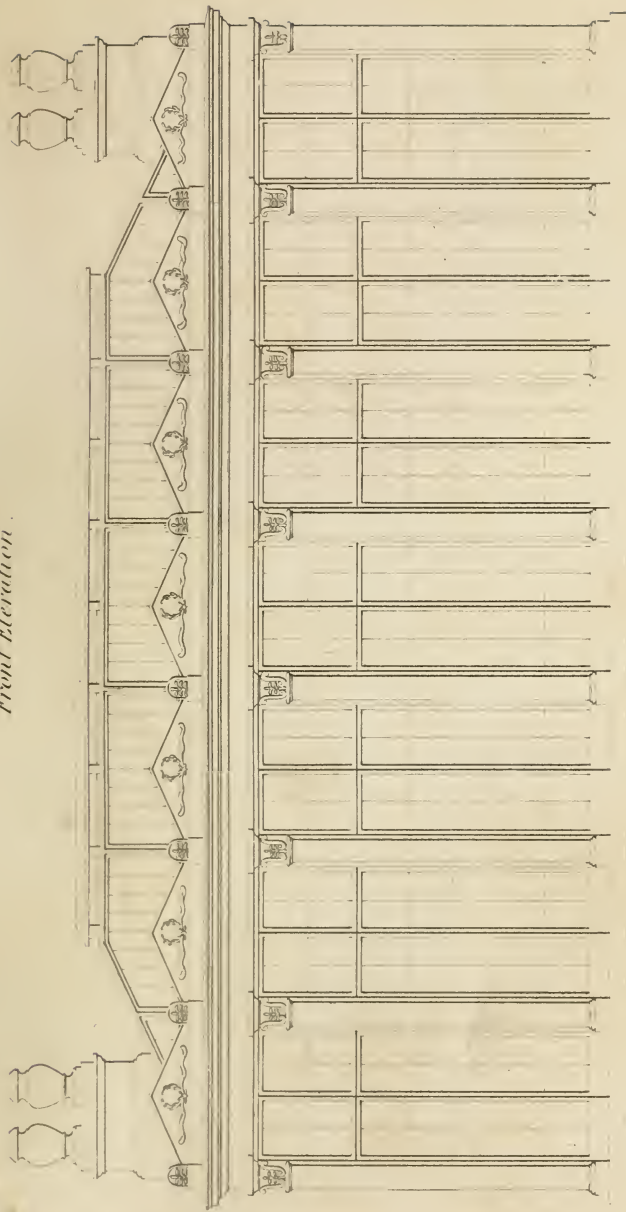
CAMELLIA CHANDLERII.

Drawn by J. T. Hart, at Mr Colvill's Kings Road



Biscuitery.

Front Elevation.



40 feet.

30

20

10

5

0



should be performed with a narrow hoe, which will not only destroy the weeds, but, by stirring up the surface, will contribute much to the growth of the crop. At the same time, thin out the crop to the distance of from three to four or five inches, according to the sorts.

Where young onions are in constant demand, it will be better to reserve a crop unthinned for that purpose, observing to thin them regularly as they are used, leaving a sufficiency of the strongest plants for a general crop. The oftener that the crops of onions are stirred up with the hoe in dry weather, the better will they bulb, particularly in stiff soils.

TRANSPLANTED ONIONS.

The onions transplanted last month will require to be gone over with the hoe, and the surface stirred among them. Any of them that appear shooting into seed should have their heart-buds picked out, as has been previously directed for winter-onions, that have not been transplanted.

PRICK OUT AND PLANT CELERY.

Prick out from the seed-bed some of the celery-plants sown in March. Dig for this purpose one or more beds of light rich earth, and rake them even; then draw out of the seed-bed some plants in a thinning manner, and prick them into the other beds, three to four or five inches distant: give directly a moderate watering, and repeat it occasionally till the plants get fresh root, and, being thus planted, they are to remain to nurse a month, or five or six weeks, to acquire proper strength; then to be transplanted finally into trenches to remain for blanching, by earthing up as they advance in growth. Plant out the strongest celery-plants of former sowings. Choose a sheltered spot, or warm border; a few need only be planted at this time for the kitchen use, as they will be apt to run to seed. The trenches need not be deep, six inches being sufficient; if room be scarce, plant between rows of early peas on a south border.

SOWING CELERY.

Sow celery-seed for a principal latter crop, in the first or second week of the month. Dig a bed of light rich earth, and make the surface perfectly even; then sow the seeds pretty thick, and rake them in lightly.

In hot sunny weather it would prove very beneficial to shade the bed every day, from ten to three o'clock, till the plants appear. Likewise, let the bed, in dry weather, be refreshed every other evening with a light watering.

The plants from this sowing will be fit to plant out into trenches in July, August, and September, and to take up for the table from October till Christmas, and for a spring supply.

HOEING AND EARTHING UP POTATOES.

The crops of potatoes, as they advance, should be hoed and earthed up. If there be any vacant piece of ground, a late crop may be planted, which will succeed nearly as well, as if planted in April, but will not keep so well during the winter.

SPINACH.

Spinach may still be sown, where required in continued succession, sowing generally the round-leaved sort between rows of peas, by which it will be partially shaded from the sun, and not run to seed so soon as if sown in an exposed situation.

In some families, spinach is required in succession all summer: in which case, some seed should be sown every twelve or fourteen days, as the plants of the summer sowings soon run up to seed: sow the seed moderately thin, and rake it well into the ground; or sow it in shallow flat drills, from six or eight inches to a foot asunder, covering in the seed regularly.

Thin the young spinach of last month's sowing; eradicate all weeds: and where the plants stand thick, thin them moderately, especially those produced from the broad-cast sowing.

THINNING THE CROPS OF BEET.

The crops of beets which are in a forward state will require to be thinned about the middle of this month; this operation should, however, be performed gradually; nor should the plants be thinned out all at once. In the first place, they should be thinned to about two or three inches distant, and to five or six in a few weeks afterwards. A showery time should be chosen, or the earth should be settled about the plants by a liberal watering. The ground should be previously hoed, and closed well about their roots.

LOVE-APPLES.

Towards the end of the month, if the weather be favorable, plant out the love-apple plants reared in the hot-houses. These plants are of a trailing rambling habit, and require to be supported or trained against a wall or pales. In cold situations, they will require a southern exposure to ripen them, and to facilitate their ripening, the shoots should be shortened or topped, when they have shown a sufficient number of flowers and are beginning to set their fruit. All lateral branches should be removed, and as the fruit begins to ripen, pick off some of the leaves, in order to admit the sun to the fruit. In dry weather, they will require a plentiful supply of water; and as they are great exhausters of the ground, they should not be planted too near to the fruit-trees. In warm situations, they will bring their fruit to great perfection if planted on a bed of mould, made so as to slope to the sun; upon this bed, which should have a considerable inclination, they may be trained and pegged down like cucumber-plants, and, in many instances, they will emit roots at their joints, which will materially tend to strengthen them. The surface of this bed may be covered with plain tiles or slates, which will not only hasten their maturity, by increasing the heat on the surface, but also keep the fruit clean and free from any earthy particles, which might be washed upon them, during the process of watering, heavy rains, or the like. In whatever way they are grown, they should not be allowed to grow too rambling, for if not pruned, and

kept within bounds, they will continue to extend themselves till killed by the frosts, and in that way expend that nourishment, which, by pruning off the superfluous growths, would be directed to the formation and maturity of the fruit. The whole plant is rather ornamental, but particularly so when in fruit; they may, therefore, be planted against the walls of houses, or in a favourable situation in the pleasure-ground, and in the most unfavourable ones they may be forwarded in large pots, and placed in any of the forcing-houses till they have fully formed their fruit, when they may be set out in a warm situation to ripen, or they may even be grown upon slight hot-beds, covered with a frame and lights, and trained like cucumbers. In unfavourable seasons, the fruit may be taken off in clusters, attached to a portion of the branch, while yet in an unripe state, and hung up in any of the hot-houses, where they will ripen in a few days.

PLANTING RADISHES FOR SEED.

The beginning of this month is the proper season for the transplantation of radishes for seed, and it should be done when the roots have attained their full maturity. The growth of them will be accelerated if the advantage be taken of showery weather.

The roots selected for seed should be long, and perfectly straight with short tops, and some attention must be paid to the color of the root. If the common red, or short-topped radish be the sort selected, the preference should be given to those that are of a clear pale red, as they possess the properties of crispness and mildness in a greater degree than those of a dark red color. If the salmon-radish be selected for seed, the palest colored roots should be planted.

The transplantation of radishes for seed is by no means a matter of minor importance, for were they allowed to run to seed in their natural bed, that degree of nicety could not be observed in the selection of the sorts, which is presented by the system of drawing up a number of roots, and choosing only those, which possess the proper requisites.

The roots being selected, proceed to plant them in rows two or three feet asunder, and about two feet from each other in the row. The situation should be open, and as soon as they are planted, a liberal supply of water should be given. The seed will be ripe in September.

The same directions are applicable for turnip-radishes, the roots of which should be of an orbicular form, of good color, and not of immoderate growth.

Radish-pods are in much request in most families for pickling, a sufficient supply can be obtained for that purpose from the plants left for seed. Choose the best-formed pods. It is of importance to gardeners to save as many of their own seeds as the circumstances of their situation will admit of, not altogether on the score of economy, but for keeping true or unmixed those seeds which are apt to sport into seminal varieties, such as the radish, most of the brassica, beets, and some others.

SOWING CARDOONS.

About the middle or latter end of the month, cardoons may be sown. The seed may be either sown where the plants are to remain, or on a bed of good earth, and afterwards transplanted into the trenches. A deep light earth is most congenial to the growth of cardoons, but it must not be of the richest kind. The leaves being large, require a considerable space, and are often blanched in the same manner as celery. They are chiefly used in soups and stews.

Trenches must be prepared on the same system as for celery, either longitudinally or crossways, about four feet from centre to centre, of the exact width and depth which a single spit will make them; the earth to be deposited on each side. A little compost manure must then be spread at the bottom of the trench, and the seeds dropped thinly, in a drill about an inch and a half deep, drawn exactly in the middle. The plants may be thinned out to about four inches asunder, when they have attained a few inches in height, but finally they must be thinned out to eight or nine inches.

GOURDS AND PUMPKINS.

Those sown on a hot-bed last month will be fit by the latter end of this month to be planted out. They may be planted to hide any old fence or wall, or on the ground by the sides of the walks. There are many curious sorts, some of the smaller of which may be introduced into the flower-garden, and trained to an upright pole or trellis.

Gourds are cultivated in the village-gardens of some parts of England for culinary purposes. The inhabitants grow them on dunghills, and train the shoots to a great length. When the fruit is ripe, they cut a hole in one side, and having taken out the seeds, fill the vacuum with sliced apples, adding a little sugar and spice, and then having baked the whole, eat it with butter. This is the melon of the gardeners of former times, the true melon being known to them by the name of the musk-melon. Gourds are much used on the continent in soups, and also stewed and fried in oil and butter.

VEGETABLE MARROW.

Vegetable marrow is a species of gourd, the *Cicader* of the Persians. It is propagated in the same manner as the other gourds, and about the end of this month may be planted out on a slight hot-bed, and covered with a hand-glass; or the seeds may be sown, where the plants are to remain; place a hand-glass over them, and they will come up, when all danger of frost is over. Accordingly as the runners extend, peg them down, they will strike root, which will greatly strengthen the plants. Give plenty of water in dry weather. It is useful for culinary purposes in every stage of its growth.

SALADS.

Continue to sow and transplant all sorts of lettuces, to admit of a succession. Give plenty of water, both to the newly sown and also to the transplanted ones. Tie up to blanch the forward crops of lettuces, choosing a dry day for that purpose; a few only should be tied up at once; this, however, must be regulated by the quantity required.

RADISHES.

Continue to sow successional crops of radishes: where wanted, give plenty of water to keep them growing rapidly; if that be not the case, they become hard, and unfit for use.

SMALL SALADING.

Sow small salading once a week or oftener, such as cresses, mustard, rape, &c. Sow another crop of Normandy or curled cress, it is to be preferred to the common cress, and is very useful for garnishing. Prefer a shaded spot for sowing all sorts of small salading during this and the two following months. When the seeds are sown, which should always be in drills, cover them with old mats, kept constantly damp, by watering them once or twice a day. These, however, should be removed as soon as the seeds begin to vegetate, and hoops should be placed over them, upon which the mats may be put during the heat of the day, about a foot above the ground.

CAPSICUMS.

If capsicums were reared last month on a hot-bed, or in pots in the forcing-houses, they may now be planted out in a sheltered spot under a wall; give them a supply of water accordingly as the state of the weather may demand.

SOWING TURNIPS.

This is a favourable time for sowing turnips, and by the latter end of July they will be sufficiently large for the kitchen. They will continue in good condition for a considerable length of time.

The early crops of turnips should always have a warm aspect, and the soil should be of the lightest and driest description. Sand or gravel, with a proportionate mixture of

loam, is the soil best adapted for turnips, for if the land be heavy, or excessively rich, a rank taste is imparted to the root, and induces it to run too soon to flower.

The most successful time to sow the seed is in showery weather, or immediately after rain; should it be sown in dry or hot weather, a great risk is run of a total loss of the crop.

A piece of mellow ground should be chosen for this crop, and the seed should be sown moderately thin, and equal in every part; it would be advisable to sow it while the ground is fresh turned up, treading it evenly, and raking it regularly.

In this month the early crops will require to be again thinned, but this should be done gradually, and not too many taken away at one time. If the seeds have risen very thick, it may be proper to thin the broad-cast crops to three or four inches square, and those which were drilled to two or three inches in line; at a subsequent period, they should be thinned out to nine or ten inches square, and to five or six in line, if it be intended that the roots should grow to a proper size.

The operation of thinning should be performed when the rough leaves are about an inch in breadth, or at least before they attain a much greater size, as the work can then be accomplished with greater expedition and facility.

CUCUMBERS FOR PICKLING.

For cucumbers to pickle, see *Forcing-Garden*.

SEA-KALE.

If sea-kale were not sown, nor planted last month, let it now be done. For directions, see *April*. For forcing of it, see *Forcing-Garden*.

SOWING ENDIVE.

Endive may now be sown for an early crop; at the same time it must be observed, that the sowings of this month should

never be depended on for a principal standing crop, as the plants are apt to run to seed; but if this vegetable be required at an early period in constant succession, it would be advisable to sow some seed at intervals during the month; and when the plants of each sowing have attained about three or four inches in height, then to select some of the strongest, and prick them out at the distance of about a foot.

The white, and a small portion of the green curled, are the most proper sorts to be sown at this time. However, a little Batavian, or broad-leaved, may also be sown for variety.

HERBS.

Propagate by sowing, cuttings, or dividing the roots, all sorts of herbs. For full directions, see *April*.

FRENCH OR KIDNEY-BEANS.

A full crop of kidney-beans may now be planted, as a succession to those sown in April, and the most proper kinds for this plantation, are the black speckled dwarfs, Battersea and Canterbury white dwarfs; the dun-colored and the large white kind may also be sown.

The drills should be drawn an inch deep, and two feet and a half distant, in which the beans are to be placed two or three inches apart; the ground must be drawn evenly over them, and the surface raked smooth.

The scarlet-runner, or any other of the running kinds of beans, may also be planted at this time, and as the majority of them are very productive, they are exceedingly profitable for the service of a family. There is a variety of the scarlet-runner that differs from it only in color, the seed and flowers being both white, but which in its manner of growth and mode of bearing has a perfect resemblance to the scarlet-runner; nor is it less deserving of our esteem in regard to the extent of its produce, and the length of time that it continues to yield its fruit.

It may be advisable, also, at this time, to plant the large white Dutch runners, they being an excellent bean, and the

Pods growing to a considerable length, but they cannot be recommended on the same principle as the scarlet-runner, for the length of time in which they yield their produce.

The drills for all the running or climbing sorts of kidney-beans should be at least four feet six inches distant, or a single drill may be drawn at the base of any vacant wall, paling, building, &c., and when the plants have attained their double leaves, and begin to push their runners, some tall sticks or poles should be placed for the plants to climb upon; or if they be planted in a row or drill at the base of a wall, some strong packthread, or junk, may be suspended from the top, and fastened at the bottom, and the runners will readily twine themselves round it to the height of eight or ten feet; they should then be topped, which will contribute greatly to the production of fruit on the lower branches.

For artizans and cottagers, the scarlet-runners are both profitable and ornamental for their gardens and cottages.

THINNING AND CLEANING CARROTS.

By the end of this month the crops of carrots will be considerably advanced in their growth, and every encouragement should be given to promote it; if the early crop have been sown broad-cast, it may be thinned out to three inches square; but if sown in lines, it must be thinned to one or two in line.

The operation of thinning may be done either by the hand or hoe, but when the crops are on an extensive scale, hoeing is the preferable method, not only as being the most expeditious, but also, that as it loosens the surface of the ground, it tends to promote the vigorous growth of the plants. It is a practice, although founded in error, but too commonly adopted by many persons, of thinning the carrots at one particular time, and, without observing any regularity in the process; but this should be studiously avoided, for it must be obvious, that a partial thinning must be productive of injury to that part of the crop, where the thinning has been neglected. Five or six inches are the proper distance at which the carrots should stand, in order that they may have full liberty to swell at the root; it is, however, recommended never to thin carrots when

the weather is dry, but always to take the advantage of showery weather; should, however, this advantage not present itself, it would be advisable to give an immediate watering to the crop after the thinning has been completed, for if the drought penetrate to the fibres and tap-roots, the carrots become stunted in their growth, and their flavor is rank and disagreeable.

Those crops of carrots which are intended to be drawn gradually for the table, whilst they are young, should not be thinned at first to more than four or five inches distant; but the main crops, that are intended to remain to grow to their full size, should be thinned from about six to seven inches distant.

Carrots may still be sown with every prospect of success, particularly if the soil be strong and stiff. It is by no means bad practice to sow in April, May, and the beginning of June.

WORK TO BE DONE IN THE CULINARY GARDEN.

If the weather in this month prove dry, the growth of many esculent plants will be considerably retarded, particularly the beans and peas which are in flower, the blossoms of which fall off before arriving at maturity, and consequently are not succeeded by fruit. A certain degree of attention is therefore necessary, to give a regular supply of water to the growing crops; at the same time, it must be observed, that in promoting the growth of the crops, the weeds are also encouraged, which at this season of the year are very abundant, and which, if not timely checked, prove highly detrimental to the young crops, by weakening them to that degree, that they never afterwards recover their full strength. There is no work in the kitchen-garden which, at this time, requires greater attention than the eradication of weeds; many will now begin to perfect their seeds, which, being shed on the ground, will occasion a considerable degree of labor for several years to accomplish their extirpation, independently of the injury which is annually done to the crops, by choking them in their growth, and exhausting the soil of that nutriment, on which the strength and flavor of the vegetables depend.

We have for many years adopted the practice of going frequently over the whole of the kitchen-garden, whether the weeds abound or not, and giving it, what may be termed, a general hoeing and raking. This method not only destroys the weeds in embryo, but it encourages the growing crops, and gives the whole a clean and cheerful appearance. For this purpose, make choice of a few dry days, the time will be well occupied, and save much trouble at a future period.

All pieces of vacant ground should now be rough dug, the action of the sun upon it will improve it much, and it will present a far neater appearance, than if left in the state when the crop was removed.

Every part of the culinary garden should now be kept in a neat and well-regulated condition, and a constant attention should be paid to the progress of all seeds committed to the ground. Those that vegetate freely should be forwarded by hoeing, thinning, and watering, and in those cases where the seed has failed, it should be immediately resown; no time should be lost when such circumstances occur; some crops, such as beets, onions, parsneps, and some others, may be restored by transplanting them from those places, where they may have come up too thick. The depredation of insects should be guarded against as much as possible, until the crops are rather advanced, for after they have formed their rough or perfect leaves, few insects attack them, at least not so as to endanger the crop.

Covering the surface of the ground, between the rows of crops, with litter, moss, tiles, or slates, has a beneficial effect at a time of severe drought, as it prevents the too rapid progress of evaporation. Frequent hoeing to a considerable depth has, to a certain extent, the same effect, and either method will lessen the labour and expense of watering. When recourse is had to watering, it should be applied as late in the afternoon as possible, or early in the morning, but never during the middle of the day, excepting where a regular system of irrigation can be effected, and even then, the water should not be allowed to come in contact, either with the foliage or the stems of the plants. When the ground can be kept in a moist state during the warm months of summer, the most luxuriant crops may be expected.

J U N E.

PLANTING BEANS.

Beans, for the last principal crop of the season, may be planted about the beginning of the month. The sorts most proper for the early crops are also the fittest for the late ones. Plant the mazagan-bean for this crop, in an exposed situation; if planted under the shade of trees, the plants will be destroyed by a small parasitical fungus (*Uredo Faba*), which has a rushy appearance, and is very destructive to the late crops of beans in shaded situations.

The beans which are now in blossom should be examined and topped, for reasons given in the preceding months.

Earth up, and otherwise stir the surface of the advancing crops, as necessity may require.

SOWING PEAS.

Peas for autumn crops should be sown both at the beginning and also at the end of the month. If the weather and the ground be dry, it will greatly encourage vegetation, if they be soaked for a few hours in water before they are sown, and it will tend much to their advantage, if when the drills are drawn, a quantity of water be poured into them, so as completely to saturate the ground. The sorts for the sowing made at the beginning of the month should be the dwarf-marrow, Hotspur's dwarf-sugar, Leadman's dwarf, and Spanish dwarf; but the best of all peas for this sowing is Knight's marrow-pea, which ought to be sown every eight or ten days, from the beginning to the end of June. The practice of well watering the drills is absolutely necessary to the future success of this pea in particular. The seeds should be sown in a single row and not thick. If the ground be not naturally deep, it must be made so, by drawing up the mould, so as to form a ridge, on the top of which the drill should be made for the seed, which after being properly watered is ready for sowing. If dry weather at any time set in, this pea will require an abundant supply of

water once or twice a week. In this way the plants continue green and vigorous, resisting mildew, and yielding fruit till killed by the frost. For the last sowing made this month, prefer the Charlton and Knight's marrow-pea

PRICK OUT CAULIFLOWER.

The cauliflower-plants sown in May for the autumnal crop, should be pricked out when sufficiently strong, into a nursery-bed of rich earth. Prepare a bed for them in an open situation, set the plants about three inches apart, then give them a little water to settle the mould about their roots. Shade them from the sun occasionally in the middle of the day, till they have taken good root. The plants are to remain in this bed for four or five weeks to get strength, and then, in July, to be planted out where they are to remain. They will produce their heads in October and November. It will be necessary to prick out a considerable number of them, as from this crop the autumn and winter cauliflowers are to be expected.

Look over the plantations of early cauliflowers, which are now coming to perfection, break down some of the large leaves over the young heads as they appear; this will blanch them of a fine delicate white colour, and prevent them from getting too open, or too advanced towards seeding, and thereby rendered unfit for the table.

Those plants which are coming into flower, and advancing in growth, should, in dry weather, have copious supplies of water at their roots, two or three times a week; this will cause them to produce large and handsome flower-heads.

TO SAVE CAULIFLOWER-SEED.

This is the proper season for the selection of those cauliflowers from which the seed is to be saved. The largest, whitest, and closest heads, should be chosen for this purpose. They should not be transplanted, but allowed to stand in the place where they were originally planted. In July, or early in August, they will shoot up into seed-stalks, and in September the seed will be ripened.

Pay particular attention to allow no plants of the brassica tribe to come to flower near where the seed-cauliflowers are planted, as all the different varieties of *cabbages*, *broccolis*, *borecoles*, *savoys*, *cauliflowers*, &c. have all originated from one single species, namely, the common white cabbage (*Brassica oleracea*.) This should also be particularly attended to in saving the seeds of every other sort or kind, as they are so extremely liable to run, or sport into varieties and monstrosities. However extraordinary it may appear, that all the varieties of those useful culinary plants should have one common origin in a plant indigenous to many of our sea-shores, yet, according to the elaborate enumeration of the brassica family, made by Professor Decandolle, we are informed, that there are even many more varieties known on the continent, of which in this country we are comparatively ignorant.

PLANTING, EARTHING UP, AND SOWING CABBAGES.

It will be now proper to sow cabbage again for a successional crop, and as the crops advance, they should be hoed and earthed up, as they may occasionally require. A few for coleworts may be sown about the middle or the end of the month, for the purpose of being planted out about the end of July, or the beginning of August. For which, see *August*.

In dry seasons, towards the end of June, the cabbage crops often become stunted, and covered with aphides to that extent, that even if they escape being entirely eaten up, they present a loathsome appearance. To obviate this, in a great measure, a plentiful supply of water should be given them at their roots, and although a superfluity of water is supposed to be injurious to the flavor of most vegetables, it does not hold good in regard to cabbages, which are not in the least affected by it.

PLANTING BROCCOLI.

Plant full crops of broccoli. Choose an open situation, and let the ground, if not already in good heart, be well dunged, and dug. Take advantage of showery weather for this operation, but if the weather be dry, let the plants have several

good waterings at the root. In planting this vegetable, and all others of the brassica tribe, prepare a puddle by pouring some water into a hole dug expressly for the purpose, and stir the mould about, so as to form a puddle of rather a thick consistency; then draw the roots of the plants through it two or three times, until a sufficient quantity adhere to the roots. If the ground be very dry, after the line be set, and a drill drawn about three or four inches deep, make a mark along the drill, where each plant is to be put; then pour some water on each spot, stirring up the mould at the same time, which will form a puddle, into which set the plants. By this means, they will resist the effects of drought longer than by any other method.

Sow more broccoli-seeds about the beginning of the month, for late planting, the flowers of which, if they survive the winter, will be fit to gather in February and March.

Prick out more broccoli plants into nursing-beds, from the seeds sown in April and May; if dry weather, give them occasional waterings.

LEEKs.

Leeks may be now transplanted, for which purpose, a number of strong plants should be drawn from the seed-bed. The long fibres of their roots should be trimmed, as well as the straggling tops of their leaves. An open spot of ground should be chosen, in which the plants should be pricked out in rows about eight or nine inches asunder, and about six inches from each other in the row, observing to insert the greater part of the shank or neck of the plant into the ground.

In planting, do not press the mould tight about their stems. Make the holes large, put in the plants, and let only a little mould fall into the holes, merely to cover their fibres.

BORECOLE.

The different sorts of greens under this general name should be planted out, accordingly as the ground becomes vacant. Plant them between crops of peas, beans, or other

such crops, which will be soon off the ground. Give a moderate dressing of dung, which will encourage them to grow to a larger size. Plant a considerable number of them, they will become very useful in winter, and afford fine sprouts the following spring, when vegetables are scarce.

BRUSSELS SPROUTS.

Plant again crops of brussels-sprouts, give water after planting, and treat them in other respects as recommended for broccoli.

SAVOYS.

Plant savoys for successional crops; the directions given for broccoli are applicable to the savoy. Or, if ground be scarce, they may be planted between rows of early beans, peas, or such crops, as are to be soon removed off the ground.

RED BEET.

The crops of red beet will now be rapidly advancing. Let them be kept clear of weeds. Stir the surface often between them, both to destroy the weeds, and to encourage the growth of the plants. Care must be taken not to injure the roots with the hoe, for if they be cut, they will be useless.

PRICKING OUT CELERY.

About the beginning of the month, prick out a number of the April sowing. These will be fit to transplant into the trenches, for a full crop, by the end of July. If the weather be warm and dry, water and shade them for a few days, until they have struck root.

PLANTING OUT CELERY.

The plants pricked out in May will be fit to transplant into the trenches about the middle of the month. A few only should be planted at this time, as they are apt to run to seed.

NEW ZEALAND SPINACH.

Spinach is a difficult vegetable to keep a regular supply of throughout the summer months, as it scarcely comes above the ground before it begins to run to seed. An excellent substitute has been found for it in the New Zealand spinach, *Tetragona expansa*. This should be sown in March in pots, and placed in a hot-house or hot-bed frame, until it vegetates. The seedling plants should be planted off, one plant in each pot, of the size commonly called sixties, and kept under the shelter of a frame until the beginning of this month, when it may be planted out without much chance of its being killed by the frost. At this time prepare a bed for the plants, of leaves and dung slightly warm; when a little heat is rising, cover it with mould to the thickness of six or eight inches, set the plants about three feet apart, protect them with hand-glasses, or hoops and mats, for a few nights, until they are properly established. In dry weather, give plenty of water to the plants; they will amply repay the trouble, for a few plants well managed will supply an ordinary-sized family with an excellent substitute for spinach, until destroyed by the frost, by which time the common spinach will be again in perfection. In gathering the crop, care must be taken not to tread upon the young shoots, which are very tender, and liable to be injured. The largest leaves should be carefully pinched off, after the manner of spinach.

SCORZONERA, SALSAFY, AND HAMBURG PARSLEY.

The crops of scorzonera, salsafy, skirrets, and large-rooted parsley must now be thinned and cleared from weeds, either by the hand or the small hoe. The plants to be thinned out to the distance of about six inches.

CAPSICUMS AND LOVE-APPLES.

If these were not planted out last month, let it now be done; the capsicums on a warm sheltered border, or at the bottom of a wall, and the love-apples on any empty wall or pales.

CARROTS.

Now finally thin out the crops of carrots, and clear them of weeds; let the hoe be drawn through them occasionally, it will promote their growth.

PARSNEP.

The above directions for carrots are equally applicable to parsneps, only allow them double the distance.

EARTHING UP POTATOES.

Now finally earth up the crops of potatoes, and clear them from weeds. They will require no farther attention till fit for taking up for use.

LETTUCES.

An open spot of ground should now be chosen for the transplantation of those lettuce-plants, the seed of which was sown in April and May: showery weather should be chosen for this purpose, for if they be planted when the season is dry, a considerable risk is run of them ever taking root. It may, however, occur at this season of the year, that the advantage of showery weather does not present itself, in which case, we recommend the adoption of the following method.

Let some small shallow drills be drawn with a small hoe, about a foot asunder, in each of which plant a row of lettuces about a foot from each other, giving them, at the same time, a liberal supply of water.

If the weather be very dry, and the sun scorching, cover the plants for a few hours every day, from about twelve to three, by inverting flower-pots over them. This will shade them, nor will it be in the least injurious to them; or they may be shaded by placing hoops over them, and in very warm days, cover them with mats for a few hours.

The advantage of planting lettuces in drills arises from the convenience which it presents of supplying them with water

more easily, than if they were planted on a level piece of ground, independently of the greater length of time that the moisture is retained about the roots of the plants.

Some lettuce-seed may now be sown, for the raising of plants to supply the table in July, August, and September. For this sowing we recommend the cos, Silesia, the brown Dutch, the imperial lettuce, and the great white Dutch cabbage-lettuce. Some of these seeds should be sown twice during this month; a moderate crop in the first or second week, and a similar sowing towards the latter end of the month.

We have found from experience, that lettuce sown where they are to remain, are not apt to run to seed so soon, as when transplanted. Therefore, if there be ground to spare, sow broad-cast, but thinly, a considerable piece of border, partially shaded, or in an open quarter of the garden, and run the hoe occasionally through them, to destroy the weeds and refresh the plants.

If a quantity of the true brown cos have been sown in autumn in an open quarter of the garden, and occasionally hoed, they will be found to last longer for use than any that have been transplanted, and sown at the same time, and decidedly longer than seeds sown early in spring, whether transplanted or not.

When any sorts of lettuce are to be saved for seed, set apart for that purpose, some of the finest formed plants, and let them stand two feet apart each way. As they send up their flower-stalks, let them be supported with sticks, to prevent them from breaking. Where different sorts are to be saved, remove each sort to as great a distance as possible from each other. As lettuce-seeds retain their vegetative properties for years, it may be as well to save only two or three sorts each year, as by this means, they will be less likely to get impregnated with other sorts.

The following is the Hanoverian method of saving lettuce-seed. Do not wait till the spike of flowers has ripened all the seeds, but cut it over on the first appearance of maturity, and lay it on the ground, when all the florets will ripen their seeds nearly about the same time.

RADISHES.

Continue to sow radishes of sorts for successional crops.

SMALL SALADING.

Sow cresses, mustard, rape, &c. once a week, if a constant supply be wanted.

WATER-CRESS.

This excellent salad may be successfully cultivated, particularly where there is a clear running stream of water. The plants can be procured in almost all streams, and should be carefully removed, making choice of the youngest. They are then to be disposed in rows parallel with the course of the stream. In shallow water, the distance need not be more than eighteen inches between the rows, but in deep water the distance must be greater. They will not grow so freely in a muddy bottom, as amongst sand or gravel, neither will their taste be so good. It is absolutely necessary to have a constant current, as when the water is in a stagnant state, they cease to prosper. They are cultivated in water-beds, but they neither prosper so well, nor is their flavor so good, as in natural streams. No place is better calculated for them than a natural stream, and no other culture necessary than keeping a stock of stout healthy plants, which can be done with little trouble, by filling up the vacancies where any may have died, and keeping them clear of rambling aquatic plants, which generally grow very luxuriantly.

PLANTING OUT PICKLING CUCUMBERS.

About the end of this month, the plants of which the seed was sown in the preceding one will now be ready to plant out. For this purpose, select a warm situation and a light rich earth. They may be planted in patches, three in each, triangularly, each plant a foot distant from the other. A yard and a half square may be allowed to each patch, taking the centre of each as

the line of measurement. They may also be planted in one line, about two feet asunder; and if more than one line be required, let them be drawn five or six feet asunder. The plants must be frequently supplied with water, and for a few days carefully shaded from the sun. This may be effected by turning down large garden-pots upon them, which may be gradually removed, that is, in the first instance in the mornings and evenings, and then entirely.

If the situation or season be cold, and there be any spare lights or frames, it will be advantageous to place them over a part of the pickling cucumbers, so as to insure a fine crop, and to come in earlier than those on the open ground. It is always of importance to choose the warmest spot for the cucumber crops, as they will do little or no good if planted in an exposed or cold situation. In dry weather, cucumbers require frequent and plentiful waterings, and in this respect they must be particularly attended to, as they advance in growth.

SOWING CARDOONS.

If cardoons were not sown last month, let that now be done; for directions, see *May*.

ENDIVE.

The endive sown in May will now be fit to transplant permanently; an open spot of ground should be chosen for these plants, let it be well dug and manured. Put the plants in by line about one foot asunder, and let them have some water as soon as they are planted. Endive sown in May, or before, is apt to run to seed before the plants arrive at any state of maturity; therefore it would not be prudent to plant any great number at this time.

Endive-seed must now be sown for a principal crop, the preferable sort for which is the green curled, not only as being the best for general use, but also as being able to stand the winter better than any other kind.

Some broad-leaved Batavian endive may be also sown. This sort grows very large, and if tied up will cabbage well, and be

very white. In hardiness, however, it by no means equals the green curled, for towards the latter end of autumn, or the beginning of winter, should the season be wet or frosty, it soon rots, and the expectations of the grower are wholly frustrated.

Endive-seed should be sown in an open spot, not too thick, and it should be raked in equally, and as regularly as the nature of the ground will admit. It would be advisable to sow this seed at two different periods during this month, one at the commencement, and the other towards the latter end. In adhering to this plan, a regular supply of good plants may be obtained.

In regard, however, to the principal autumn and winter crop, the seed should be sown, generally speaking, about the third or fourth week of the month, for that which is sown earlier is very apt to run to seed at the beginning of autumn, and before the plants have attained their full maturity.

TURNIPS.

A principal crop of turnips should now be sown, about the middle of this month, for the autumn and winter use, and considerable benefit will be derived in sowing the seed in showery or rainy weather, or if the prospect presents itself of such weather coming on. Particular care must be taken in sowing the seed equally, and immediately afterwards tread it down and rake it evenly.

The crop which was sown in May should now be hoed, and the plants thinned out in a regular manner. This work should be done when the rough leaves are about an inch broad, and if it be performed at this time, it will greatly accelerate the growth of the plants, which should be thinned to about nine or ten inches apart.

TURNIP-FLY.

This injurious insect has long baffled the ingenuity of both agriculturists and gardeners to devise the means of its destruction, and it still continues annually to make its ravages on

the turnip-crops sown in the summer months. Mr. Patrick Neill, an enthusiastic horticulturist and man of science, says, "One of the easiest remedies is to sow thick, and thereby ensure a sufficiency of plants, both for the fly and crop." Mr. Mean proposes a simple remedy, which is to steep the seed in sulphur water, in the proportion of one ounce of sulphur to a pint of water; this quantity will be sufficient for three pounds of seed. Mr. Gorrie, in one of his valuable communications in the Caledonian Horticultural Memoirs, however, found that neither steeping in sulphur-water, nor sowing soot, ashes, nor sea-sand in the drills, had any good effect; he at last tried with success, dusting the plants, while in their seed-leaf with quick-lime, and he adds, that should rain fall before the plants are out of danger from the fly, the operation must be repeated. He calculates that a bushel of lime is sufficient for an acre of drilled turnips. Mixing old and new seed has been recommended, and successfully practised. The old and new seeds to be of equal quantity, and then dividing the mixture into two parts, one of which is steeped twenty-four hours in water; by this means, four different periods of vegetation are procured, and consequently four chances present themselves of escaping the fly.

ASPARAGUS.

In the cutting of the shoots of asparagus, attend to the directions given in the preceding month, but it is advisable to terminate the general cutting for the year about the twentieth or twenty-fourth of this month, otherwise the roots will be considerably weakened, for as long as the produce is cut, the roots continue to send up new shoots, although decreasing every time in size. Thus, if the cutting be continued late in the season, the roots will be thereby considerably exhausted, and the produce of the succeeding year proportionably diminished.

The season of this useful vegetable may be prolonged, if attention be paid to the annual making of new beds, and this practice possesses this great advantage, that it admits of the older beds being destroyed, the cutting of which may be con-

unued, as long as any shoots of consequence make their appearance.

Previously to the asparagus running up to seed, the beds should be perfectly cleared from weeds, for this operation cannot be so effectually accomplished, after the stalks have attained a considerable height.

The young plants which were sown in the spring should now be carefully weeded with the hand, but not with the hoe, as the latter would endanger the growth of the young buds.

GENERAL CROPS OF ONIONS.

At the beginning of this month, the crops of onions should be thoroughly cleared, and in those places where the bulbs stand too close, they should be regularly thinned, either by the hand or the small hoe; but for extensive crops, the latter method is by far the most expeditious. In either method, however, particular care must be taken to have the operation performed in proper time, for it will be found, that stirring and loosening the earth proves highly beneficial to the growth of the plants. Regularity should be particularly observed in the thinning of this species of crop, leaving the most promising plants at a distance of at least three inches asunder, and those which are intended for the full crop of larger bulbs, at a distance of four or five inches. All weeds should at this time be effectually eradicated.

GATHERING THE CROPS OF WINTER ONIONS.

About the end of this month, or the beginning of July, the crops of onions will be so far advanced towards maturity, as to be gathered for winter use, and experience proves that they will keep better and longer than those of any other sowing. They should be spread out thinly on the ground for a few days to dry and harden, and then laid up in the granary or store-room, exposed to the influence of the sun and air, until sufficiently dry.

WHITE AND GREEN BEET.

The cultivation of the white and green beet is generally confined to the use of their leaves, which are used in soups, and on some occasions are boiled in the manner of spinach. When the leaves of the large white beet have attained their full size, they are stripped to the mid-rib, which, being in itself thick and fleshy, is peeled and stewed, and then eaten like asparagus.

As the leaves of these plants grow to a considerable size, they should be allowed ample space to grow; in thinning them, therefore, a distance of six or eight inches ought to be observed between every plant, and in other respects, the same directions will apply as those, which have been already given for the cultivation of the red beet.

FRENCH OR KIDNEY-BEANS.

A successional crop of kidney-beans should be planted at this time, for which purpose any of the dwarf kinds may be chosen. In order, however, to have a regular supply, a crop should be planted in the first week, another about the twentieth, and a third towards the latter part of the month.

The climbing or running kinds of kidney-beans may also be planted at this time, the proper sorts for which are the scarlet blossom, the large white kind, and also the white Dutch. If for a full crop, they should be planted in the first or second week of the month, although they will succeed if sown at a later period; the crops which were planted early in the month will begin to bear in July, but in August they will be in full bearing. The scarlet-runners will continue to produce until October.

In the planting of the different kinds of kidney beans, especial care must be taken to allow each sort a sufficiency of room, in order that they may not be stinted in their growth. For this purpose, drills should be opened for the running kinds, from three and a half to four feet apart, and for the dwarf kinds, the drills should be drawn from two to two feet and a half distant, and an inch and a half in depth. If the weather

be dry, the drills should be well watered before the beans are planted, and the earth should then be regularly drawn over them.

All the advancing crops should be cleared from weeds, and a little mould drawn to their stems: this will strengthen the plants and accelerate their growth.

HERBS.

Propagate sage by cuttings, borage and marigold by seed, also savory, thyme, and sweet marjoram by seed, and hyssop by cuttings. Prick out the plants of burnet, borage, sorrel, clary, marigold, angelica, &c., which have been raised from seeds last year.

Gather mint, balm, and other herbs, towards the end of this month for drying, the most proper time for which is when the plants are nearly at their full growth and beginning to flower. They must be cut on a dry day, and those for keeping immediately spread, or hung up to dry in an airy room, out of the reach of the sun, and where they may dry gradually, as the heat of the sun would affect them too much, and render them of little use. All plants, whether for distilling or drying, should be gathered when almost arrived at their full growth and are beginning to flower; therefore, if they have not arrived at that state of maturity, the cutting should be deferred for a few days or weeks longer.

WATERING CROPS OF CULINARY VEGETABLES.

Gardeners are at variance in their opinions on the merits of watering crops of culinary vegetables, some advocating the practice, and others condemning it. If a system of watering be once commenced, it should be continued until rendered unnecessary by rain, for if it be once begun, and suddenly desisted in before rain falls, the crops will be rather injured than improved by it. Watering sparingly is of little use, and therefore, if circumstances do not admit of its being prosecuted with an unsparing hand, it is better to desist from watering altogether. During the hot months of our English summers, a liberal supply of water would, no doubt, be beneficial to most

crops on the generality of soils, and when circumstances will admit of partial irrigation, the crops may be expected to derive considerable benefit from it. The gardeners in the vicinity of London, who are without doubt the best managers of their ground, annually incur great expense in this process, and long experience proves to them the important advantages resulting from it. Irrigation has, from the earliest ages, been considered an important part of field and garden culture, and it may not be going too far to suppose that the idea originated from the annual overflowings of the Nile. Some crops withstand long droughts without sustaining much injury, when once they are properly established in the ground, but by far the greater part in ordinary cultivation suffer materially from a dry season. Mulching, shading, and stirring the soil, are remedies to a certain extent, and are performed with much less labor and expense than irrigation. The crops of most vegetables, where the drill system is practised, can be readily mulched, that is, the ground round their roots is covered with substances, which prevent too powerful an evaporation, and at the same time have a tendency to enrich the soil, consequently to afford a considerable degree of nourishment to the crop. Of all substances for this purpose, dung is the best, which if spread in the spaces between the drills, will have the most beneficial effect. The sweepings of lawns, waste straw, rotten tan, sawdust, &c. will afford shade to the roots, and prevent too great evaporation in the soil. Slates, tiles, and boards have been recommended, and found to be attended with good effect. Smaller crops, such as salads and young seedlings, may be readily shaded with mats, supported on hoops, for a few hours daily, and the beneficial results will, in most cases, justify the plan. Hoeing or stirring the surface frequently, during protracted drought, has been proved to have the effect of rendering the soil less impervious to the heat of the sun, thereby keeping the soil beneath both cooler and moister, and the deeper that this operation is performed, the better will the crops be found to stand. This latter mode is also applicable to crops sown broad-cast, but in a less degree, as, from the position of the plants, the hoe cannot be applied so as to loosen the soil to such an extent as in the drill system.

WORK TO BE DONE IN THE CULINARY GARDEN.

Attend to the directions given last month, and now thin all crops as they advance. Keep the hoe in full employment in every part of the garden. Support with stakes the crops that may require it, and water, as far as is practicable, every thing that stands in need of it. Destroy insects, eradicate grubs, which, at this season, are by far more mischievous in the garden than any other object. This must be done by picking them up where they appear. Destroy slugs by picking, or by watering with lime water, or strewing hot lime round the plants: the former is the most effectual method. Let every part of the garden now assume a neat and clean appearance. Where watering is necessary, let it be done from four to six in the morning, and from six to nine in the evening. For this labor the men should be allowed extra wages, or if it be preferred, let them rest in the middle of the day. In large gardens, water ought to be applied by means of a small fire-engine, worked by three or four men; this will water the quarters of the garden without treading the ground. One man at the end of the pipe will disperse the water regularly, without being obliged to tread much upon the ground. At the same time, the wall-trees can be well washed, which will be of much importance to them, provided that water has not been brought into the garden, as recommended in the former part of this work.

There is no garden so situated, but water might be brought to it by some means or other, and those that are indifferently supplied with this necessary article, will always be subject to many disadvantages, over which the cultivator can have little control.

J U L Y.

SOWING BEANS.

A few mazagan beans may be sown about the beginning of this month. Sow them on a sheltered south border; if the autumn be mild, they may probably produce a few dishes of young beans, but if not, the trouble is not great.

SOWING PEAS.

In the first week of the month a few of Knight's marrow-pea may be sown, or the Charlton or early frame. Give them occasional waterings in dry weather. They may afford a few peas in autumn, if the weather be mild. Little dependance, however, should be placed on this sowing, but the crops of Knight's marrow, as directed for last month, will, if properly attended to, come in both abundantly, and, in all probability, will last until the frost destroys them.

PLANTING LATE CAULIFLOWERS.

About the latter end of the month, the cauliflowers which were sown in May, and intended for a late crop, and which were pricked out the latter end of June, will now be of a proper age to plant out permanently; they may be planted in an exposed situation, at not more than eighteen or twenty inches square, as the flowers of this crop will not attain to so large a size as those of the former crops of the season; they must, however, be planted in a rich soil, in order that they may be obtained in the greatest possible perfection, and in the greatest abundance. If they be properly stored, according to the directions given in October, some excellent cauliflowers may be had at Christmas, and even at a later period. They must be regularly watered if the weather be dry, and in all other respects attend to them, according to the directions given for the other crops of cauliflowers.

PLANTING CABBAGES.

Prepare ground to plant out full crops of cabbages for autumn and winter use. Let the ground be well dug, and moderately dunged. Plant the cabbages in lines, two feet apart, and eighteen inches between the plants in the line; if ground be scarce, plant as before directed between rows of peas, beans, or such crops as are soon to be cleared off the ground. Let a good supply be planted at this time; if the weather be dry, give plenty of water, until they be established in the ground.

TAKING UP THE CROPS OF WINTER ONIONS.

As the crops of onions which were sown last autumn, and were transplanted, as has been already noticed, as well as those which were not transplanted, begin to ripen, particular attention should be paid to them, and their tops bent down, which will hasten their ripening. Those which are already ripe should be pulled, and carried to a dry place for a few days to dry and harden, before they are removed to the store-house. If they have succeeded well in their growth, they will be in general large, and should be tied up in bunches or ropes, as they are generally called, and hung up for use.

TRANSPLANT CELERY.

For this purpose, prepare trenches in order to plant out a good crop for autumn and winter use. These trenches are often made only one foot wide, and a single row of plants put in each. This is a very good method for early crops, such as were planted last month, but it is evidently a great waste of ground. The method we would recommend has been practised by us for many years, and is generally adopted by the market-gardeners in the vicinity of Edinburgh. Make the trenches from four to six feet wide, and one foot deep or more, throwing the mould taken out of the trench equally on both

sides of the trench, taking care to break the mould as finely as possible, which will render it fit for the earthing up of the crop as it advances.

Lay a good quantity of rotten dung in the bottom of the trench, which dig in to a reasonable depth, or if the ground be shallow, and inclined to a gravelly bottom, the dung may be regularly spread on the bottom of the trench, and an inch or two of mould taken from the sides to cover it. In beds thus prepared, set the celery plants, which have been transplanted into a nursing-bed the preceding month, in rows across, about one foot apart, and the plants eight inches distant in line. When planted, give the whole a good watering. If the weather be dry, the beds may be watered as the process of planting proceeds, and after all the plants are set, give them a good watering to settle the mould about their roots. The dung should be from six to nine inches thick, and as rotten as can be procured. The great advantage of this method, independently of a great saving of ground, is, that if any quarter of the garden be fixed upon and cropped with celery, it will be, in two years, completely trenched, and manured over to any depth that the trenches may be made, by making them the second year in the space occupied by the mould between the trenches of the preceding season.

The facility of earthing up the crop is greater by this method than by the other. When the plants require to be earthed up, take two boards of the same length as the width of the trench, and six or eight inches broad; place the boards between two rows of the plants, which can be done by a boy, then place them pretty close to the plants, and the space between the boards should then be filled up with mould very finely pulverized, by two men, one on each side of the trench. When a sufficient quantity of mould is put in, remove the boards, and proceed to another space, and so on till the whole be completed. We have found from experience that this is the most expeditious method, and the same piece of ground will contain more than six times the quantity of celery that is generally obtained from the single drill or trench system.

In the Gardeners Magazine for March, 1827, the following method of growing celery is recommended by Mr. George

Gledstone, at Netherwillon, Northumberland, and he declares it to be the result of an experience of thirty years.

Select a piece of ground in an open situation, if it be level, the better. If the celery be grown in single trenches, they ought to be five feet apart; if six feet trenches and planted across, leave five feet between. But to proceed with the single trench: this must be thrown out three feet wide, and three and a half deep, place a stake in the centre at each end of the trench, make the bottom level, beat in clay regularly to the thickness of six inches; then lay two courses of stones or bricks lengthways of the trench, and parallel to each other, leaving a space of one foot six inches between. Each course ought to be eight or nine inches thick, and laid in lime-mortar; the clay should be well pointed to the stones, to make all water tight, this being the only utility the clay and stones are intended for.

The trenches are now to be filled to the height of the stones, with a composition of strong clay loam, common earth, and rotten dung, then pour in as much water as the trench will hold, making the whole a sort of puddle. It will be advisable to lay a slate or flat stone down the centre of each trench, to prevent the clay from being injured by any unskilful hand that may be employed in taking up the celery, or renewing the composition in the trenches. Level down the soil to and over the stones, filling the trench in the centre with the above composition to two feet from the bottom; this places the plants fifteen inches above the puddle, and forms a trench one foot below the surface, which is an advantage in earthing up the plants.

Where early celery is required, it is advisable to sow a little seed in the first or second week in February. Where there is the convenience of a vinery, sow it either in boxes or pots, giving the plants plenty of air as soon as they vegetate; plants grown in heat are more apt to run to seed than when sown in the open ground. As soon as the plants are fit to transplant, provide a slight hot-bed, cover the inside of the frame with flat stones or slates, laying their edges close to each other, then cover the stones or slates with strong fresh loam and rotten dung to the depth of four inches. As soon as the soil is warm, fill the frame with the young plants three inches apart each

way; observe to take off all the tap-roots, give a little water, and put on the lights; give plenty of air, and when the plants are well rooted, take off the lights every mild day, and leave plenty of air at nights. When the plants have become tolerably strong and hardy, remove the lights altogether, and cover only at nights with a mat, watering freely in dry weather. When the plants have reached the height of six or eight inches, they ought then to be removed into the trenches: cut the plants out in squares, placing them carefully about eight inches apart in the trench. When the work is performed by a careful and active hand, they will scarcely feel their removal; their roots will reach the puddle in the space of fifteen or twenty days, when their growth will be accelerated in a rapid degree. There will be a visible change in their external appearance, from an ordinary hue to a deep dark green, nearly bordering upon black. When the plants have grown to the height of eighteen or twenty inches, they will then require a little earthing up, but be sure to give a good watering first, and place a little water-run sand round each plant, which keeps all clean and free from worm-eating and canker. Where a retentive bottom is found, this preparation is not necessary; but to prevent worm-eating or canker, when the trenches are prepared in the ordinary way, draw a drill three inches deep, in the centre of each crop, fill the drill with sand and plant as usual.

If a good stock of celery plants be planted in a composition as directed above (but not in a hot-bed), upon a piece of ground beaten hard to prevent the roots striking deep, you may with these plants fill the early celery trenches the second time in the same year, and one quarter of the dung used in the common way will do to renew the trenches after the first year. By allowing the plants four inches distance from each other in the composition, they will grow strong, and remove when twelve or fifteen inches high, and be soon ready to earth up.

BORECOLE.

The different sorts of greens under this general name should be planted, as directed last month. Let every piece of vacant

ground, which is not intended for any other crop, or for any operation of improvement, such as trenching, winter-fallowing, &c., be now filled with the different sorts of greens, savoys, Brussels-sprouts, and broccolis. Many of the latter sorts will probably be destroyed by frost, but should they all survive, they will be useful in spring, when vegetables are generally scarce. If circumstances will admit of it, make choice of different situations for them, in order that the greater probability may exist of a considerable number of them surviving the winter. Situations which are the least exposed to the full action of the morning sun in spring are undoubtedly the best, and next to that, a high dry exposed situation, avoiding, if possible, those places which are under the shade of trees, as the rain dropping from them will keep the crops always damp, and the obstruction which they give to the free circulation of air will generate a dampness, extremely injurious to vegetables.

BRUSSELS-SPROUTS.

Plant successional crops of this useful vegetable. Let the ground be well manured, and allow the plants to stand two feet apart. Hoe and earth up the crop planted last month, which will encourage their growth.

SAVOYS.

Plant full crops of savoys at the beginning, and for later crops, at the end of the month. In all other respects observe the directions given for borecoles.

SOWING AND PLANTING ENDIVE.

At the beginning, the middle, and end of the month, endive for a full crop may be sown. The green, and white curled are very good sorts for general use, but any of the other sorts may be sown according to fancy. They are divided into two general divisions, the first are the curled endives with narrow leaves, and are by the French called *Chicorées*; the other division comprehends the broad-leaved sorts, commonly called

Batavian endive, the *Scaroles* of the French. The Batavian sorts are of large size when well grown. That sort called the small Batavian is decidedly the best of the Batavians, as it blanches with little trouble, and is mild without being bitter.

About the middle of the month, the endive which was sown according to the directions given in June, will be fit to plant out. An open spot of light rich earth must be chosen, which must be dug a full spit deep. Then some shallow trenches must be formed with the spade, or large drills made with the hoe, about twelve or fifteen inches asunder. The plants are to be set in these trenches or drills, about nine or ten inches apart, and a moderate watering immediately given to them, which must be occasionally repeated until the plants have taken fresh root.

The tap-root must be a little shortened before planting, as well as the points of the leaves. The reason of planting in deep drills, instead of on the plain surface, as is often done, is, that the leaves may be blanched with little trouble, and the water applied to their roots not be wasted. To have endive large, it is absolutely necessary to plant it in ground of which one half is nearly composed of rotten manure.

BLANCHING ENDIVE.

The blanching of endive is frequently performed in the same manner as early cabbages, by tying them up with strands of matting. If, however, the plants be carefully earthed up, the blanching of the curled kinds will be thereby more easily accomplished than by tying up, as they do not come together so well in the hearts. On the other hand, the Batavian kinds thrive better by being tied up, arising from the more upright manner of their growth. If, however, the plants be set in drills, the process of blanching may be facilitated by adopting either of the methods according to the option of the grower.

Another method of blanching endive presents itself, which is performed by setting up common roofing tiles over the plants in the form of a triangle, and if tiles cannot be procured, large slates will have the same effect; but a method attended with less trouble is to place some thin boards, about a dozen feet

in length, and nine or ten inches in breadth over the plants, and the mould drawn up to their sides so as to keep them in a steady position. In several places, however, pots are to be procured made for the express purpose of blanching endive, and are similar to those used for sea-kale, only rather smaller in size. The common garden flower-pot will blanch endive well, and the same directions will apply as those which have been already given for sea-kale.

EARTHING UP CARDOONS.

It is now the proper season to give a final thinning to the cardoons which were sown in May, and they should be left at a distance of eight or nine inches apart in the row. The ground must be hoed amongst them, for the purpose of stirring the surface, and also for the eradication of any weeds that may be in the ground. A little of the earth which was thrown out in the formation of the trenches, may be put to their stems, but too much earth must not be put at one time, and the greatest care must be taken not to bury their heart-leaves. The earthing up must always be done when the ground is dry, and it must be repeated every two or three weeks during the summer, for if the plants be allowed to grow to any length between the earthings, a considerable difficulty will be experienced in performing the operation properly, on account of the rapid growth of the plants.

There is a species of cardoon cultivated in France under the name of cardoon of *Tours*, which is reckoned better than the sort cultivated in England. It is of so formidable a nature, in consequence of the spines, with which it is thickly covered, that great caution is necessary in working amongst them to avoid personal injury. A strong leather dress and gloves are therefore worn in all operations with this species. It has not been yet introduced into the British gardens, as far as we can learn.

Cardoons sown in June for a full crop, may, about the end of the month, be finally thinned out; taking care to earth them up as they advance in growth.

SOWING CARDOONS.

Cardoons for a late crop may yet be sown; and it is probable they will succeed, if the winter be not severe. A spot should be chosen as dry as possible, and the seed sown as directed in May.

CARROTS.

About the beginning of this month sow some carrot-seed, to raise crops for use in October or November, and if slightly protected, they will continue good until the spring.

ARTICHOKES.

At this season artichokes will be coming into use, and if it be wished to have them of a large size, in order to encourage the main head, all the suckers or small heads, which grow out from the sides of the stems, should be pruned off. Particular care should be taken, immediately after having cut off the head of the artichoke, to break the stalk down close to the ground. This practice, although disregarded by many as unworthy their notice, is nevertheless of greater consequence than is generally imagined; for if the stalks be suffered to remain, they greatly impoverish the roots, and exhaust them to such a degree as to injure their future bearing.

SOWING ONIONS.

Towards the latter end of the month some onion-seed may be sown to stand the winter, for which purpose a spot of rich ground should be dug in a sheltered, but not a shaded situation. The ground having been divided into beds about four feet wide, proceed to sow the seed moderately thick, and rake it well; or the seeds may be sown in drills, according to the directions already given for spring crops. About Michaelmas the plants will have attained a sufficient degree of strength to enable them to sustain the severity of the winter, and in the following months of March and April, they will furnish the necessary supplies for salads and other culinary purposes.

When the plants have attained a moderate size, they should be carefully weeded, which, if neglected, the weeds will soon overtop the plants, and check them in their growth, if not wholly destroy them. (See *next month*.)

SOWING WELSH ONIONS.

This is a very hardy sort of onion, and withstands the severest frosts. Sow now a small bed of them, and they will come in use in the spring. It is a perennial plant, and need not be sown every year. A bed, in tolerably good ground, will last two or three years, or longer.

PLANTING LEEKS.

If a sufficient quantity of leeks were not transplanted last month, let it now be done. The ground should be well manured, as they will remain upon it till the following spring. Leeks are, to use the common expression, a gross feeder, therefore the ground cannot be too highly manured for them.

SOW BROCCOLI SEED.

Broccoli-seed may be sown at this time for a late spring crop, and it should be the last sowing of the season. It would also be advisable that the seed should be in the ground before the tenth, or at the latest, before the fifteenth of the month. A bed of rich mellow earth should be chosen for this seed, and if the weather be dry, a moderate watering should be given.

About the middle, or the latter end of August, or the beginning of September, the plants raised from this sowing will be sufficiently forward to prick out where they are to remain, and in April, or the beginning of May, a supply of small heads will be obtained.

PLANTING BROCCOLI.

A full crop of broccoli may now be transplanted, for which purpose a piece of the richest ground should be dug, and if it

has been previously well manured, it will prove of considerable benefit to the crop.

The plants should be set out in rows, allowing at least two feet between each row, and about the same distance from one another in the row. Immediately that they are planted, give them some water, and if the weather should subsequently prove dry, the watering should be repeated once every two or three days, until the plants have taken root.

Look carefully over the whole brassica tribe in showery weather, and destroy slugs, which otherwise would soon destroy the crops. Much has been said on the destruction of slugs, but we have never found a more effectual method than that of simply picking them up with the hand. This ought to be the first thing done in the mornings, the earlier the better, and as they are gathered into a flower-pot, let them be carried away to a great distance from the garden, and buried; or, if they be thrown into a tub, and a quantity of hot water poured over them, they will soon be destroyed.

Continue to look carefully for a few mornings over the crops subject to be annoyed by the slugs, and the injury will soon be remedied. Lime is sometimes strewed round each plant, but it soon loses its alkalescent properties when laid on the damp ground, and much sooner when exposed to the dews and rain. Lime-water has been recommended, but that is attended with more trouble, and less success, than the plan of picking them up by the hand.

FRENCH OR KIDNEY-BEANS.

Kidney-beans may now be planted for a late crop, for which purpose either the running kinds or the dwarfs are the most proper. It must, however, be observed, that unless the seed be planted before the third week of this month, this crop very rarely succeeds, especially if the autumn be unfavorable.

The situation most proper for this crop, is where it may in some degree be sheltered from the severity of the frost, which sometimes happens in the mornings of September; but if the weather prove mild, this crop, if regularly and constantly gathered as it is produced, will continue to bear until October.

In the planting of beans at this season, if the weather be very hot, and the ground parched, it will be found beneficial to soak them in pond or river water for seven or eight hours; putting them into the water in the morning, and immediately on taking them out, to plant them. Considerable advantage will be derived from watering the drills before the beans be planted.

It must, however, be carefully observed, that the beans should not be soaked, excepting under the above-mentioned circumstances; at any other time, it will be found sufficient to water the drills well, and then to plant the beans immediately, covering them over lightly with earth.

WINTER-SPINACH.

Winter-spinach may be now sown, and for this season the prickly-seeded kind is the best, as being better able to endure the cold rains and frosts than the round-seeded sort. This crop, unless in a cold or exposed situation, need not be sown until the first or second week in August, (see *August*); and even in a warm exposure, it were better to defer it until the latter end of that month.

For this seed a situation should be chosen that has the advantage of the winter's sun, and after the ground has been well dug, the seed should be sown thinly, in drills, and raked in, or the seed may be sown broad-cast, and then afterwards raked in regularly.

It will be found beneficial to sow a little brown Dutch or common cabbage-lettuce with the spinach-seed for winter use.

The ground intended for spinach cannot be too highly manured, in fact, it is upon old dunghills that it will grow to its largest size.

As this spinach is intended to stand during the winter, it would be advisable to sow two crops, one on ground highly manured, and the other on a soil of lesser richness. The former will be in high luxuriance for autumn and early winter use, and the latter, being less succulent, will more effectually resist the influence of frost, and be in good condition until the spring.

TURNIPS.

This month may be considered as the most favorable season for the sowing of turnips for autumn and winter use. The plants raised from this sowing will be fit to draw in September, and will improve in growth from Michaelmas to Christmas, and should a moderate winter ensue, they will continue in perfection until the following spring.

An open situation should be chosen for this seed; the ground well dug, and the seed sown whilst the earth is still fresh; particular care must be taken not to sow it too thick.

The turnips which were sown in June should now be hoed, and this operation should be performed when the weather is dry. All weeds should be cut down, and the turnips thinned out to about seven or eight inches distant.

At a season when the turnip-fly is not apprehended, the seed may be put into the ground without any preparation; but if the seed be sown in the hot weather of summer, it is advisable to make use of some cheap preventive of the fly. It appears from a trial of Mr. Knight, at the suggestion of Sir Humphrey Davy, that lime slaked with urine, and mixed with a treble quantity of soot, if sprinkled in with the seed at the time of sowing, will protect the seeds and germes from the ravages of this pernicious insect. This antidote, however, cannot be conveniently applied, unless the seed be sown in drills. A remedy, still more simple, has been recommended by other horticulturists, which consists in merely steeping the seed in sulphur-water, in the proportion of an ounce of sulphur to a pint of water, which will be sufficient for soaking about three pounds of seed.

In the dry seasons of 1825 and 1826, when few turnips were raised in the kingdom, we derived considerable advantage by covering the ground with common hurdles, as soon as the seed was sown. By this means, the ground was partially shaded, at the same time that it was prevented being trodden upon by the people during the process of watering. It must, however, be observed, that in this case, the ground was well saturated with water before the seed was sown, a practice

which, in dry weather, is of the highest importance to every crop. The hurdles were allowed to remain on the ground until the rough leaves had appeared on the turnips. As a proof of the efficacy of this practice, a piece of ground, which was sown on the same day and with the same kind of seed, but on which the hurdles were not placed, did not produce one plant within a yard of each other.

SOWING COLEWORTS.

This is the proper time to sow a full crop of coleworts, for autumn and winter use, and also for plants to stand until the spring, when the savoys and other greens have been consumed.

In order to have good colewort plants, sow some of the best Yorkshire or sugar-loaf cabbage-seed; the Battersea and Antwerp kinds may also be sown, but all the kinds of slow-hearting cabbage should be rejected. Considerable benefit is derived from sowing the above seeds, as those plants, which are not cut in their colewort state may be allowed to stand to cabbage.

If coleworts be wanted for winter use, the seed should be sown the last week in June, or at farthest in the first week of this month. This sowing will produce plants fit for use in November and December; but if plants be wanted for spring use, the third or fourth week of this month is soon enough to sow the seed.

An open spot of ground should be prepared for each sowing, and divided into beds of three or four feet in width, in which the seed should be sown moderately thick, and raked in regularly. In about a week or ten days, the plants will make their appearance, and in September will have attained sufficient strength for transplantation. The plants should be set in rows about a foot asunder, and about seven or eight inches distant from each other in the rows.

CUCUMBERS FOR PICKLING.

The cucumber plants which were sown or planted in the natural ground to produce picklers, should be now attended to.

The vines will have begun to advance, and should be laid out in regular order; but, at the beginning of the month, it will be proper to dig and loosen the ground lightly between the holes of the plants, taking care not to go too near to disturb their roots. In the course of this operation, draw some earth between and round the stems of the plants in each hole, pressing it down gently, with the view of making them spread different ways. At the same time, draw the earth up round each hole, in order to form a basin to contain the water which is given in dry weather, and as the runners of the plants advance in growth, let them be trained out in a regular manner and pegged down. This will induce them to push out roots at their joints, and thereby impart additional strength and vigor to the plants.

In dry weather, the plants must be liberally supplied with water, which, if the season be very hot, should be given every evening.

GARLICK AND ESCHALOTS.

The eschalots and garlick which are full grown should now be taken up, the proper season for which is known by the leaves, which always begin to wither when the bulbs or cloves have attained their full size.

GATHERING SEEDS.

When the weather is fine, gather the different sorts of seeds as they ripen, and immediately that they are collected, spread them on a dry place, exposed to a free current of air; let them lie until they be sufficiently hardened, turning them every day, then having beaten and cleared them from their husks, and all other refuse, store them away in bags or boxes.

HERBS.

Plant all the sorts of herbs which have been propagated this season, either by cuttings or seeds, accordingly as they appear sufficiently strong and well rooted. Also gather flowers

of medicinal and other herbs, and when dry, let them be put up in bags for use. Those which are in request for drying or distilling, as they advance to maturity, should be cut or gathered, and disposed of in a dry airy room, till they be distilled, or otherwise used.

SALADS.

Sow and plant successional crops of lettuces. Sow at the beginning, middle, and again at the end of the month. These sowings will provide lettuces for the months of September and October. Thin and transplant all sorts of lettuce fit for that purpose; allow plenty of room, and give occasional supplies of water.

TURNIP-ROOTED RADISH.

This is the best time of the year to sow the large black turnip-rooted radish, for autumn and winter use. There are two sorts, generally known by the name of the black and white Spanish radish, the former of which is held in the highest estimation, and is the most universally cultivated.

The seed may be sown any time during this month, some in the beginning of it for autumn use, and some for the principal winter crop, about the middle of it. It should be sown broadcast in an open space of ground that has been just dug, trodden down and raked in regularly.

When the plants have attained some size, they should be hoed out to about six or eight inches distant; in September and October they will be ready to draw for the table; by November they will have attained their full growth, and continue in perfection during the whole winter.

Some small turnip-radish may be also sown for autumn use, which should be principally of the white sort, mixing with it a small portion of the red. The radishes sown last month should now be thinned to about three inches apart.

SOWING SHORT-TOP AND SALMON RADISHES.

Short-top and salmon radishes may be sown any time this month to draw in August; but for a principal autumn crop to

draw in September, some of each sort should be sown in the last week of this month. The seed should be sown in an open exposure, in ground that has been newly dug.

SMALL SALADING.

If a regular supply of small salading be required, some of each sort, such as mustard, cressos, &c., should be sown every week.

The seed should be sown on shady borders, in drills, and in dry weather should be daily watered, or it will not vegetate regularly. If the weather be very sultry, shade the crops during the greater part of the day with mats. A mat well soaked in water, kept in that state, and thrown over the beds when the seeds are sown, and there left until they vegetate, will greatly promote their growth; the mat, however, must be removed as soon as the seeds are fully above ground.

WORK TO BE DONE IN THE CULINARY GARDEN.

Attend to the directions given last month, as far as regards watering, clearing the ground of weeds, and hoeing and earthing up all crops as they advance. Again give a general hoeing to the whole garden, remove all disagreeable objects, destroy insects and slugs. Attend to neatness and regularity in every part. Let all useless and decaying leaves and stems of vegetables be removed from among the crops, and carry them to any piece of ground that is to be immediately dug; this will not only give the garden a neat appearance, but will manure the ground on which they are put. The leaves and stems of all crops of cabbages, potatoes, carrots, turnips, &c., as they are daily gathered for use, are to be carried away to an unoccupied place and cut off, and as soon as convenient be dug into the ground, or carried at once to the compost-yard for making vegetable mould. They should not be left carelessly on the ground on which they grew, unless they be such roots of cabbages or borecoles as may be wanted to produce sprouts for a future crop.

AUGUST.

SOWING CAULIFLOWER.

Cauliflowers for the early crops of next year are to be sown this month at the middle, and again at the end of it. Long experience has taught the London market-gardeners to sow upon the 21st of the month, but that any one day in particular should be chosen, appears ridiculous. If they be sown too soon in the month, they are apt to button; and if too late, they will not be sufficiently strong to weather the winter. The first sowing may be made the end of the second week, and the second sowing the middle of the third. Sow on a border of light earth, and give water if the state of the weather demand it.

SOWING SPINACH FOR WINTER AND SPRING USE.

Spinach should be sown both at the beginning and also at the end of this month, to produce a supply during autumn, winter, and the spring months, until the spring-sown crops come in to succeed it. The prickly-seeded sort is to be preferred for this sowing, as being less tender than the round-seeded kind, and better calculated to stand the severity of the winter. Ground intended for spinach cannot well be too highly manured, as the larger and more succulent the herb is, the more it is esteemed. Spinach, however, when too strong, will not stand the winter so well as that, which is less succulent. Still, if the weather be mild, such strong crops will afford an abundant winter supply. As at this season there will be plenty of spare garden-ground, we have found it to be good practice to sow a piece of ground, slightly manured, with this crop, as a substitute for the other, should it fail during the winter. Whichever mode is adopted, it is necessary to choose a sheltered, but not a shaded situation for it, that is, one that is dry and well exposed to the sun. In wet soils, ridges may be formed a foot or eighteen inches high, on

which the seeds should be sown; this will not only preserve the spinach, but also act as a winter fallow to the ground.

SOWING CABBAGE.

The cabbage, being a biennial, the principal crops are obtained by sowing the year previous to that in which the crops are to be reaped. A nice attention ought to be paid to the time of sowing this crop, which is the first or second week in August, this time being most conducive to ultimate success. Some sow in the end of July, to have plants stronger before the approach of winter, but of a crop so forward, many of them, and often all, run to seed in the spring; therefore, be careful to make the principal sowing neither sooner than about the fifth, nor later than about the twelfth of August. If sown sooner, many of the plants would run to seed in spring; and if sown later, they would not acquire sufficient strength before winter to enable them to stand severe weather. The sorts to be preferred for this sowing are early dwarf York, East Ham, early emperor, and sugar-loaf, for first crops; and large York, large sugar-loaf, Battersea, Penton, Imperial, Antwerp, Russian, &c., for secondary spring crops.

TRANSPLANTING CELERY.

Celery for a principal crop should be planted both at the beginning, middle, and end of the month. Make the trenches four or five feet wide, and bury in them a thick coating of good moist dung. on which set the plants in rows across the bed a foot apart, and five or six inches apart in the line. When planted, give frequent and copious supplies of water, and if the weather be hot and dry while the operation is going on, let them be shaded by mats supported on sticks laid across the trenches. The waterings must be continued while the dry weather continues, or until the plants be perfectly established. Celery, being indigenous to wet moist ditches, requires a more than ordinary supply of that element. Earth up the early crops as they advance, in doing which, care must be taken, at all times, not to let any earth fall into the hearts

of the plants which would destroy the heart-buds, and cause them to push a number of stems, consequently they would be rendered wholly useless. This operation should never be performed in wet weather, nor in the morning, until the sun has absorbed all the moisture from the plants, otherwise the stalks would become scabbed, spotted, and be unfit for the table.

PLANTING COLEWORTS.

If a succession be required, coleworts may still be planted, as directed last month.

SOWING, PLANTING, AND BLANCHING ENDIVE.

About the middle of the month endive may be sown for a late crop. A number of those which were sown last month may also be planted out, according to the directions given in July (see *July*). The advancing crops must be cleaned and hoed, and if an early crop of endive be required, the blanching may be begun either by earthing, tying up with strands of matting, or in any other manner as directed in July. In a few weeks, it will be fit for use.

SOWING CARROT-SEED.

Carrot-seed may be sown in a moderate quantity, to rear plants to stand through the winter for spring use. Sow some the first week, and again about the end of the month. Choose a light dry spot to sow them on. Do not sow too thick, and take care to rake in the seed regularly.

SOWING WINTER ONIONS.

The most proper time to sow a full crop of winter onions is the first or second week in this month; the ground in which they are sown must be dry and rich, for if it be heavy or wet, the crop is apt to be thrown out by frosts. It is, however, beyond dispute, that this is the most proper time during the

whole year to sow for a full crop, on land that is very light, for in ground of that nature, the crops which are sown in the spring are apt, in the summer months, to be attacked by maggots, and the crop is thereby entirely lost. This, however, is not the case with onions sown at this time, as before the heat or the summer sets in, the crops are well grown, and beyond all danger.

The most proper kinds are the Strasburg and Deptford, the preference, however, should be given to the former, and in order to insure a plentiful supply in the spring, the seed should be sown rather thickly, green onions being then in request, as well as a stock for transplanting.

LAYING DOWN THE CROPS OF ONIONS.

At this time the spring sown crops will be fast approaching maturity, and, with the view of forwarding them, and promoting the swelling of the bulbs, they should be carefully laid, according to the directions already given in May. Those which are in the most forward state will be fit to be taken up by the middle or end of the month, directions for which, see *September*.

PLANTING OUT SAVOYS.

Savoys for autumn and winter use should now be planted out. In order to have them of a fine size, the ground, if it has been previously impoverished, will require a good dressing of dung; but if planted where early potatoes, or such crops which have not much exhausted the ground, have been grown, they will attain a good size without any further preparation. Savoys, and all other sorts of greens, may with propriety be planted between rows of peas, beans, and similar crops, where ground is scarce, but in doing so, they should be well dunged. Choose the best formed plants, and plant them two feet, or two feet and a half apart between the rows, and fifteen or eighteen inches distant in the line.

ARTICHOKES.

The plantations of artichokes will now be coming into fruit : when it is the object to have large heads, all, or the greater part of the smaller ones, which issue from the sides, should be displaced ; but when the small heads are used for culinary purposes, they should be thinned out while they are still young.

Three or four heads are a sufficient crop for plants of a middling strength, but those which are very strong and well-established may be allowed to produce a greater number.

Artichokes, in order to produce chard, should, as soon as the principal crop is gathered, have their leaves cut over about six inches above the ground, and their stems cut as close to it as possible. It is to be observed that, to produce chard, the plants will be destroyed, therefore a certain portion of the stock of plants should be set apart for that purpose, and on the supposition that new plantations are made annually to a certain extent, the loss of a portion of the oldest plants will be in conformity with good practice.

CUCUMBER PLANTS.—See *Forcing-Garden*.

BROCCOLI.

At the beginning of this month, prepare a piece of ground for the reception of a crop of broccoli, for which purpose an open spot should be chosen, not shaded by trees, and let the ground be well dunged, which will considerably improve the crop.

The plants should be set out in rows about three feet apart, and about the same distance, or at least two feet asunder in the rows, and immediately after planting them, give to each of them a moderate watering if the ground be dry.

The broccoli-plants which were transplanted last month should now have the earth drawn up round their stalks, at the same time giving them a liberal watering ; this will strengthen them and forward their growth considerably.

PARSLEY.

Parsley may be sown this month, for winter and spring use, this being the most natural season for sowing biennials.

SOWING TURNIP-SEED.

For the latest crop, turnips may be sown at the beginning and towards the end of this month. The advantage should be taken of moist weather, or the seeds will be liable to fail.

The turnips sown last month should now be hoed and thinned out, for which operation a dry day should be chosen.

It is always the better practice to have them properly thinned out before they have grown too large, for which reason, as soon as the rough leaves appear, it is time to begin to thin them, as it can then be done with a greater degree of regularity. Thin them to about four or six inches apart. The sorts to sow at this time are the yellow Dutch and Aberdeen yellow, both excellent of their kind; a little of the Maltese yellow may be sown, being a beautiful and excellent small root. In families, where these may be objected to, on account of their color, the common round white may be substituted, but it is not so good a root for keeping.

SOWING AMERICAN CRESS.

About the middle or latter end of the month, black American cress may be sown on a warm border, or on beds of light dry earth, in any situation that is well exposed to the sun. It is very hardy, will stand the winter well, and come in for use early in the spring.

SOWING RADISHES.

Crops for autumn supply should be sown three or four times about the end of this month. A dry and rather sheltered situation is to be preferred, as has been already observed in the preceding month. The quicker these plants are grown the more tender and crisp will they prove. When stinted in

growth, they become hard, sticky, and entirely unfit for use. The expense of the seed is trifling, and the trouble small, therefore repeated small sowings are to be preferred to larger crops, which would consequently take a longer time in using. Any of the kinds may be sown at this time with almost equal success.

SOWING BLACK SPANISH RADISH.

This excellent and useful winter salad should be sown at two or three different times during this month. As they have the property of keeping long after they are full grown, if stored in sand or in dry mould, in a sheltered situation, they may be sown in considerable quantity. Birds are apt to destroy the seeds of all the radish tribe, therefore precautionary measures should be taken to prevent the destruction of these crops.

SOWING SMALL SALADING.

Chervil may be sown in every respect as directed for American cress, and will stand during the winter, if not excessively severe.

Cresses, mustard, rape, &c. may also be sown once or twice during this month. They will continue longer fit for use than during any of the preceding months. Sow rather a large border of Normandy or curled cress, at the bottom of a wall or pales, it will prove an excellent salad in autumn and winter.

SOWING LETTUCE FOR SPRING USE.

Sow on an open border, or in light warm soils in the open quarters, a portion of brown cos-lettuce, broad-cast, but thinly, to stand the winter and to come in use in spring. If the weather be not unusually severe, they will stand the winter, and come in after those that have been wintered in frames, or under any other shelter, and will not run to seed so soon as many of the early spring-sown sorts.

HERBS.

Continue to cut or gather all sorts of pot and medicinal herbs, as directed in July, according to the season and their state of growth.

WORK TO BE DONE IN THE CULINARY GARDEN.

Hoe, weed, thin, and stir the surface among all crops; water, shade, and attend to neatness and order; clear off all crops, as soon as they are exhausted, in order that the garden may always present a neat and orderly appearance. As slugs and other vermin will be now making deplorable ravages among crops of young plants, a constant attention is required to subdue them. Those seeds which are ripening should be gathered when dry, and after being properly hardened, laid by for use in a dry airy seed-room.

Some seeds retain their vegetative properties better when kept in the pods or seed-vessels, until they are to be sown in the spring; these, when perfectly dry, should be hung up in bunches in an airy shed out of the reach of frost. Accordingly as the crops are removed, let the ground be cleared of the refuse, either by hoeing and raking, or rather by rough digging, which will give the garden a much neater appearance, besides very much improve the soil by exposure to the atmosphere. Where evergreen hedges are attached to the culinary garden, this is a proper season for clipping them, and when the box edgings require renewing or mending, that may also now be done with every prospect of success.

SEPTEMBER.

PLANTING ENDIVE.

A small portion of the endive which was sown in August may now be planted out for a late crop. A warm border, or a sheltered situation, should be chosen for the plants; the soil should be light, and with these advantages, this crop will have a good chance of standing during the winter. Attend to the directions given in June and July for the advancing crops.

The leaves of the early sown endive may be tied up to blanch, observing to perform this operation in dry weather. Choose the largest full-sized plants of luxuriant growth and full in the heart. The leaves must be gathered up evenly with the hand, and tied a little above the middle of each plant with some bass or a small osier twig.

BLANCHING AND PLANTING LATE CROPS OF CELERY.

The crops of celery as they advance should be earthed up as previously noticed. As the goodness of this crop depends on the attention paid to this part of their culture, it would be needless to mention, that the oftener that they are moulded up, the finer and more luxuriant will be the produce.

Crops to come in during the latter end of winter and in spring should still be planted, the latter of which should be set out in single trenches, as being more readily covered during severe frosts, and the plants will be less exposed to damp during the autumn, and consequently the process of earthing them up will be more readily accomplished.

EARTHING UP CARDOONS.

By the end of this month cardoons will have attained a considerable height; the blanching of them should be proceeded in accordingly.

For that purpose, provide a number of small hay-bands, with which their leaves should be tied closely and regularly together, for the purpose of enabling the mould to be put up round each plant. Let the mould be well broken, and lay it up about them as high as they are tied. Those earthed up now will be fit for use in October, November, and December, and for some time afterwards. In severe frost, they should be covered with dry litter, according to the directions given for celery.

CAULIFLOWERS.

The cauliflowers sown in August will now be fit for transplanting into a nursing-bed; for this purpose, prepare a bed of light rich mould, about the size of a common garden-frame, on which the young cauliflower-plants should be set, in order that, if cold and wet weather set in, the advantage may be taken of placing a frame and lights over them. This being done, draw from the seed-bed some of the finest of the plants, and deprive them of all their decayed or broken leaves. The plants which are crooked or black in their stems should be rejected. They should be planted in rows about three or four inches apart, allowing nearly the same distance between the plants in the row. Particular care must be observed not to plant them so deep as to bury their hearts, the consequence of which would be their total destruction.

The plants being set out, give them a little water for the purpose of settling the earth about the roots, but this operation should be performed in a very gentle manner, or otherwise the leaves may be broken or the earth washed into their hearts, either of which circumstances would prove highly detrimental to the plants.

If the plants be backward in their growth, and small in size, it would be advisable to set on the frame and lights, which must be continued on for a few days until the plants have taken good root. When this has taken place, the glasses are again to be taken off, and used only occasionally during the following month. Observe that the plants should have a shade thrown over them when the sun is very strong, and

during the whole of the time that the lights are kept over them, air should be admitted to them, to prevent their drawing up too slender.

If any heavy rains come on, it will, under those circumstances, be necessary to put on the lights again, as a shelter to the plants. A superabundance of moisture would, at this time, be very injurious to the young plants, causing their stalks to turn black, and be the means, perhaps, of entirely rotting them.

The plants having remained in the bed for about five or six weeks, they should be transplanted where they are to remain under shelter during the winter.

MICHAELMAS CAULIFLOWERS.

Some of the cauliflower-plants which were set out in the month of July for a Michaelmas crop, will, towards the latter part of this month, or the beginning of the next, begin to show their heads. They should, therefore, be encouraged in their growth as much as possible, by drawing the hoe between the rows, and drawing the earth up round their stalks. They should also be kept clear from weeds.

If the weather in this month prove dry, dispose the earth round each stalk in the form of a basin, into which pour a quantity of water; by this means their growth will be so accelerated, that their heads will have attained a tolerably large size in October and November.

If at this season any neglect be shewn in watering the plants, the consequence will be that the heads will be very diminutive in size.

WINTER SPINACH.

The crops of this vegetable directed to be sown last month should be thinned out as they proceed, and completely kept clear of weeds, either by repeated hoeing, or hand-weeding; the former, however, is always to be preferred, as the necessary stirring of the surface encourages the growth of the plants. In wet weather, the latter mode of clearing them should be

adopted. Crops may still be sown for spring use, and as the plants will be smaller than those which were sown last month, they will have a better chance of standing the winter.

ARTICHOKES.

As the young leaves of artichokes intended for chard, and which were put in a state of preparation for that purpose last month, advance to the height of a foot or eighteen inches, they should be tied together with strings of matting and then enveloped with clean straw, and gradually moulded up, as practised with cardoons, or the leaves may be carefully held together by the hand, and bound round with hay-bands, and the mould drawn round them.

MUSHROOMS.

Mushrooms have long been held in estimation in this country, and the cultivation of them is not of modern date. The early gardeners seem to have cultivated them on ridges of warm dung, and no mention is made by any of them of mushrooms having been found at any time of the year of natural growth.

The circumstance of their being so frequently found in almost all old pastures, in greater or less abundance, cannot, however, be supposed to have escaped their observation, and it is probable that from such places they procured their spawn. Indeed, one old writer on the cultivation of mushrooms directs, "when the beds are made, and of suitable warmth, look out for mushrooms, which will be beginning to appear by this time (*September*); when they are of the size of small peas, take up the whole mass and remove it to the bed prepared for them, taking care not to break the pieces, but as little as possible. Plant these pieces among the dung, which cover with a little mould, and in a few days they will be fit for use." The same end would most probably have been attained, had they remained in their original situation.

How far mushrooms may be considered wholesome, as an article of food, may be questioned. Few of the numerous family of *Agaricus* are eaten in this country. In other coun-

tries, for instance France, they are not so particular, and in Russia they are eaten almost indiscriminately.

The edible sorts are considered by Sowerby, in his work on English fungi, to be *Agaricus campestris*, or common field mushroom: this species is decidedly the best for all the purposes of the kitchen. *Agaricus violaceus*: this species requires a deal of boiling, and when properly done and seasoned is very delicious. *Agaricus pratensis*, *Agaricus procerus*, *Agaricus deliciosus*, when well boiled and seasoned, have the exact flavor of roasted muscles. *Agaricus orcadus*: this species is often met with in old pastures, and always in a quantity together. It forms what is vulgarly called the fairy rings, on account of their growing in circles, which are not always but only sometimes perfect: the vulgar suppose, that these circles are traced by fairies in their dances, and some writers in the Philosophical Transactions consider them to be the effect of lightning. Mr. Cavallo, however, denies that lightning is at all connected in their formation. Others have supposed them to be formed by ants, which are generally found in them in great numbers. If the ground, however, be cleared away, to the depth of two inches, the spawn of this fungi will be found in abundance, and is of a greyish white color. This species may be eaten with safety, either in the common way, or made into catsup. *Agaricus virgineus*, *Agaricus solitarius*, *Agaricus lactefluus*, *Agaricus cinnamomeus*: these species when boiled have a pleasant flavor, and when fresh have a spicy perfume. *Agaricus aurantiacus*, and *Agaricus chantarella*: of all these sorts, however, it would be highly dangerous for any person but the experienced botanist to collect as food, excepting only the *Agaricus campestris* and *Agaricus pratensis*.

There are other species of fungi, which are much esteemed by epicures, as well as those of the agaric family. The truffle, for instance, which is also a native of Great Britain, is sought after with much diligence by the truffle-hunters (its cultivation not being yet properly understood). Those plants, if they deserve that name, (but in strict botanical language they are nothing more than a fructification), are found in woods and chiefly under ground.

Unwholesome fungi will also often spring up, even on artificial beds in gardens: thus, when the spawn begins to run, a spurious brood often precedes a crop of genuine mushrooms. Great caution is, therefore, to be observed in the gathering of them; and even the edible garden mushroom, *Agaricus campestris*, when grown in certain places possesses deleterious qualities.

Mushrooms growing in woods, or by the sides of hedges, are seldom safe. Those growing in open old pastures should be preferred, and from such situations the mushrooms are supposed to be much more delicate in flavor, and more tender in flesh than those which are even grown on artificial beds. Young or button mushrooms grown on beds are, however, firmer and better for pickling, than those of the same size, growing naturally. In using cultivated mushrooms, there is evidently less risk in having the deleterious kinds intermixed, as the persons employed in cultivating them are more correct in their judgement between the wholesome and the deleterious sorts.

Accidents so frequently occur from eating spurious sorts of mushrooms, that the following extract from the Botanist's Companion may be useful and not devoid of interest.

“ All fungi should be used with great caution, for even the *champignon* and *edible garden mushrooms* possess deleterious qualities when grown in certain places. All the edible species should be thoroughly masticated before taken into the stomach, as this greatly lessens the effects of poisons. When accidents of this sort happen, vomiting should be immediately excited, and then the vegetable acids should be given, either vinegar, lemon-juice, or that of apples; after which, give ether and antispasmodic remedies, to stop the excessive bilious vomiting. Infusions of gall-nut, oak-bark, and Peruvian bark, are recommended as capable of neutralizing the poisonous principle of mushrooms. It is, however, the safest way not to eat any of the good but *less common* sorts, until they have been soaked in vinegar. Spirits of wine and vinegar extract some part of their poison; and tannin matter decomposes the greatest part of it.”

CULTIVATION OF MUSHROOMS.

That mushrooms are produced by seed is beyond all doubt, and, although exceedingly minute, it is proved by microscopic examination to be produced in astonishing quantities, and placed between the gills. Thin plates of talc have been placed under a large mushroom by Knight, as detailed in the Horticultural Transactions, at the period when the minute globular bodies, which are supposed to be the seeds, first begin to be disengaged from the gills, and the numbers which fell in a given period, within the narrow field of a very powerful lens, amounted, according to the nearest and lowest calculation that could be made, to two hundred and fifty millions of seeds, from one mushroom, in ninety-six hours. These seeds were mixed with unfermented horse-dung, and produced plenty of spawn. A great portion of these minute seeds is, probably, abortive, and, when ripe, are disengaged from the parent plant, and carried in all directions by the wind, or other effective causes, and falling upon bodies not congenial to their natures, many remain in a dormant state, or soon lose altogether their vegetative properties.

This seems to be the general case with the seeds of cryptogamous plants; the air at times must be replete with these minute bodies, which are blown about in all directions, and falling on all objects, vegetate in particular seasons on certain bodies and in certain situations, so that no space is left in the whole universe, that is not productive of the works of nature. Those seeds of mushroom, which may have fallen on matter congenial with their nature, make their appearance in due time, when put into a state of active vegetation by a genial temperature, and a proper degree of moisture. The dung of some animals seems to be the proper nidus for the reception of their seeds. That of horses is found to preserve them in a greater quantity, and with greater certainty, than any other. "Hence it would appear," says Nicol, "that their stomachs have less power to hurt or to destroy the vegetable quality of these seeds, which being collected along with their food, must pass through their intestines, than that of other animals; or perhaps the dung of horses is a better nidus for the seeds than

other dungs. The food of horses, consisting mostly of corn and hay, may, no doubt, be more replete with the seeds of mushrooms than that of cows and other stock, whose food consists chiefly of green vegetables; but even the droppings of horses while at grass, or feeding on tares, produce few or no mushrooms. This fact would seem to prove, either that the seeds are collected in greater quantities, and are better preserved by hay, or the straw and chaff of oats, than by green food; or, that green food may have the effect of destroying them by its moistness in the stomach, or after having passed through it."

Having thus entered into some detail on the seed of mushrooms, the next and most important consideration to the gardener is, the manner in which to make or procure the spawn. Spawn is defined by Abercrombie, Neill, and others, to be a white fibrous substance, resembling broken threads, and is found running in dry reduced dung, or any other nidus favorable to its existence. These threads, when put in action in a favorable situation, produce small tubercles, attached to them by lateral threads, in the manner of potatoes. Spawn of the true *Agaricus campestris*, or eatable mushroom, smells exactly like that of the mushroom, and this is the test generally applied by gardeners to ascertain its genuineness.

Spawn is often purchased by gardeners from nurserymen, who, to supply their demands, make annually a great quantity of it. It is sold in the shape of bricks, and varies in price, according to the demand, and other circumstances.

Indigenous spawn may be collected in September in old pasture lands. It is often also found in the path of a bark-mill worked by horses, or in any other horse-mill track under shelter; in temporary sheds, in which horses are fed and take occasional shelter in winter, and in dry dung-heaps, and in old hot-beds. Having found the pieces of dung which contain the desired spawn, take them up as entire as possible, and lay them carefully in a basket, or any other conveyance; these are to be stored till used in any dry convenient place, and if they be found in a damp state, they should be dried before they are laid together in a mass. The dry spawn may be preserved for years; but to preserve it from running or perishing

before it be planted, it is absolutely necessary to keep it in a dry place, through which there is a current of air.

Artificial spawn may be procured by the following process, which has been recommended by a successful cultivator of mushrooms, in the *Memoirs of the Caledonian Horticultural Society*.

In the month of March, when the cattle are fed principally on dry food, collect two parts of cow-dung, one part of sheep, and one of horse-dung, dry them well, and break them into small pieces.

When well mixed together, lay them up in a round heap, finishing the top into a point. Let the heap be well trodden whilst it is building, which will prevent it from heating too much. This operation must be carried on in a dry place, in some shade or old house. Thrust a stick into the heap when finished, and by drawing it out at any time, the heat can be ascertained. If, upon examining the stick, it feels slightly warm, then the heat is going on well. Care must be taken in this particular, for in the whole culture of mushrooms by this, or any other means, they are equally impatient of either too much heat, moisture, or cold. The best temperature for them seems to be from 55 to 60 degrees of Fahrenheit. When the heap is in a slight state of fermentation, cover it about four or six inches with straw. If the operation be carried on in a warm shed, then a single old bass-mat will be sufficient, but this must be regulated by the state of fermentation in the heap.

When the heap has been a month or five weeks in this state, examine it, by thrusting in the hand to the middle of the heap, and if the spawn have begun to run, it may be distinguished by the appearance of many small white fibres or threads running through the dung, and this is the real spawn. If there be no appearance of spawn, cover the heap up again, and add two or three inches of droppings fresh from the stable. This when again covered over, as at first, will set the whole in moderate fermentation, and at the end of another four weeks, the whole will be a mass of spawn, provided that the fermentation has not been allowed to exceed the temperature above stated. Sometimes it will make its appearance sooner; and by

this means excellent spawn is procured. Spawn, procured in this manner, should be used soon after making, as it will lose its strength by long keeping.

Artificial spawn may also be procured by collecting the droppings of horses fresh from the stable, and after being partly dried, may be put up in any dry corner of a shed, mixed with a small portion of light sandy earth, that is quite dry. If this remain undisturbed for two or three months, the whole mass will be full of spawn.

In this case, also, fermentation must not be allowed to exceed the points noticed in the before-mentioned method.

Spawn, once obtained in small quantities, may be propagated or preserved at pleasure. The general method of preserving and propagating spawn is to transplant it, if we may so express ourselves, into bricks composed of certain materials, of which the dung of horses constitutes the principal part. Take any quantity of horse-droppings fresh from the stables, to which add about one-third cows'-dung, and a small portion of light sandy earth, or road-scrappings. Mix the whole together by adding such a portion of water, as will allow the whole to be formed into a thick sort of mortar. This being done, spread the mixture on the floor of a shed about four inches thick, let it remain in that state for a day or two, according to circumstances, to dry, and when it is sufficiently dry, let it be cut into pieces about the size of common building bricks. When these bricks are sufficiently dry to remove without breaking, carry them to an airy place, where they may dry sooner. For this purpose, place them on thin boards, they can then be moved about with greater ease. When the bricks are about half dry, perforate each in two or three places about half-way through, in which holes, place a small piece of spawn in each. Turn them frequently over to promote their drying. When perfectly dry, prepare a quantity of well-fermented dung; place a layer of it, six inches thick, on any part of the shed-floor; upon this dung, pile all the spawn-bricks in regular order, keeping the sides perforated uppermost, to prevent the pieces of spawn from falling out. Build the pile as open as possible, and let the whole terminate in a point, or single course of bricks. Take the remain-

der of the fermented dung, and cover the whole pile with it; it will diffuse a gentle heat through the whole. The spawn will soon run through the bricks, and when this is observed, let the bricks be laid by in a dry place till used. They will keep fit for use for a number of years. It is of much importance that the bricks should not be left in a situation which would cause the spawn to work; an effect, which would be produced by moisture, combined with warmth. The spawn must not be suffered to advance towards the rudiments of the mushroom, which consists of little threads or fibres, for in this state, it ceases to be of use in spawning a bed. A piece of spawn, which appears in filaments or fibres, is no longer of use to put in a mushroom-bed, it may produce a mushroom in itself, but can serve no other purpose. The spawn, that is to be inserted in a bed, and to receive its development there, must not be so far advanced, but should only have the appearance of white mould.

MAKING MUSHROOM BEDS.

The spawn being procured, the next consideration is, to make ready a bed on which to plant it. Many plans have been adopted for the cultivation of mushrooms on beds, which have been attended with greater or less success; the general methods practised by gardeners, who grow a considerable quantity for the London market, are perhaps the oldest, and at the same time the best. These beds are made in the open air, in some convenient spot, and are in the form of a ridge, or triangle, the base of which is generally the longest side. In gardens, where neatness and regularity are attended to, the melon-ground will be found the best situation.

For winter-crops, beds may be made in any spare shed, or old building; and it may here be observed, that, although September is the month generally chosen for putting up mushroom-beds, they may be made with success almost at any other time of the year. When beds are made in sheds, they are apt to get too dry in summer; in the open ground, the humidity of the air keeps them in a state sufficiently damp, without the necessity of often giving them water, which is a

very delicate point in their culture. If it were possible to keep them sufficiently damp, by covering them from the sun and winds, and exposing them to very slight showers, or rather heavy dews, it would be desirable, as watering, however carefully done, is apt to run upon the surface, and render some parts of the beds too damp, while others are too dry.

The principal objection to beds made in the open air is, that they are troublesome to cover, and to protect from frost and wet; but beds made in sheds also require often to be covered in the same manner.

The advantages they possess, on the other hand, is important, as the mushrooms produced on ridges are considered, in Covent-Garden market, as decidedly superior to those grown on shelves or boxes in houses, being both more heavy and juicy, and always bring the highest price.

About a fortnight or three weeks before the beds are to be put up, provide a quantity of fresh horse-dung; let it be well shaken and mixed, and put up in a heap to purge it of its fiery heat; let it be turned over once a week, or oftener, and at each turning, well mixed, so that every part of the dung may be equally fermented, and deprived of its noxious quality. When the dung is in a fit state to be made into a bed, let the bottom be marked out, about seven feet wide, and as long as it is judged necessary, for the quantity of mushrooms required; let the foundation on which it is made be dry, or rendered so; let the dung be worked up in a sloping manner, so as to terminate with a narrow roof-shaped ridge along the centre, about four or five feet high, beat it well down, as the process of building goes on. Beds made in the open sheds are constructed exactly in the same way.

When the bed has been made some time, 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, the better plan is to spawn it at first only half-way up all round. Break the spawn in small pieces, and stick them into the sides of the bed, in rows about six inches, piece from piece. When the bed is spawned as high up, as it is thought the heat of the bed will not injure it, take some good strong rich earth, the stronger the better, but of a loamy quality, and cover the

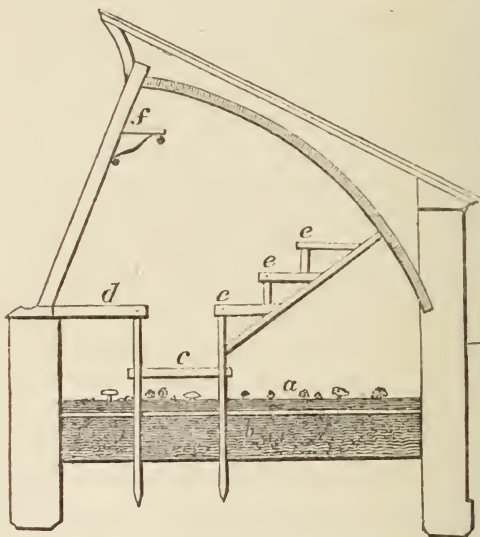
spawned part of the bed with it, about two inches thick, beginning at the bottom of the bed. The earth should be in a pliable state: not too wet, nor over dry. When the heat appears to have sufficiently declined, proceed to spawn, and earth the top of the bed in the same manner. Or, if it be thought that the bed is not sufficiently fermented, spawn it a few days before, or even a week or more before the mould be put on it.

After all fermentation has stopped, and on the approach of wet or cold weather, the beds should be covered sufficiently with clean straw, and over that, bass or reed mats should be placed; the latter will have the effect of completely throwing off the rain. Care must be taken that, after this covering is put on, they do not heat a second time, which is very liable to take place, as the remaining heat and steam will be prevented from escaping, and were that circumstance to happen to any considerable extent, the spawn would run a great risk of being completely destroyed. This covering must be occasionally removed, at least so far as to admit of the beds being examined, at least once a week, for the first few weeks after being covered. Little injury can be apprehended, at any subsequent period, from too much heat. Beds constructed in this manner sometimes lose their heat too soon, and when that is the case, the mushrooms will be small, the beds unproductive, and sometimes the mushrooms will not appear at all. On this effect being perceived, the covering should be entirely removed, and a coating of well-fermented stable-dung applied over them to the thickness of a foot or more, according to the season, and the quality of the dung; this will throw a genial warmth into the bed, and will set the spawn in action. This being accomplished, the whole may be removed, and the beds covered up as before.

The length of time that elapses between making the beds and producing the mushrooms, depends upon a variety of circumstances, such as the state of the weather, the quality of the spawn, and the like. Generally, they begin to produce in a month or six weeks after being put up, and continue to produce for ten or twelve weeks, and often for a considerable time longer. The process of gathering the crop is to uncover

the beds carefully, and cut the mushrooms up by the bottom, taking care not to displace nor injure the young ones which are coming up close to them. As far as can be with safety accomplished, the old stumps or root-part should be removed, having a tendency, when left in the beds, to produce decay, damp, and maggots. The larger mushrooms are used for a variety of purposes, but the smaller or button ones are most esteemed in cookery.

Mr. Napoleon Bauman, Jun., of Bollweller, in the Upper Rhine, has, in a letter addressed to the Editor of the Gardeners' Magazine, transmitted to him an account of a very simple and economical method of growing mushrooms, which will be understood by a glance at the accompanying sketch, where the mushrooms are represented rising through a stratum of earth (*a*);



which, with a substratum of dung, occupies the entire floor of the house (*b*). The pathway (*c*) is supported from the floor by the posts which are rendered necessary at any rate for supporting the front shelf (*d*), and the shelves of the stage (*e e e*). Vines may be trained upon the rafters, and there may or may not be a small shelf or a bracket here and there for drooping plants (*f*). In the vicinity of Vienna, houses in which mush-

rooms are grown in this way are chiefly employed for prolonging the bloom of forced shrubs and flowers, such as roses, lilacs, bulbs, &c. The pots are set in saucers, to prevent any water dropping on the mushrooms, and six inches of hay are spread over the latter to keep them clean, and prevent the escape of heat. The glass is covered by shutters every night, and the floor of the house is from three to four feet under the external surface, which with the covering of hay is a great protection to the bed in which the mushrooms are grown.

The bed is made of fresh horse-droppings, strongly pressed, and after it has lain eight days, it is covered with an inch of good earth beaten to a firm state, and the spawn planted in it in little bits about nine inches apart every way.

For growing mushrooms in flued houses, see *Forcing-Garden*.

Mushrooms may also be successfully cultivated in boxes, pots, or hampers, or indeed in any thing capable of keeping the materials together, and placed in any dry warm cellar, stable, or shed, where they can be defended from damp and frost. The practice of Mr. W. Wales, as given in the *Memoirs of the Caledonian Horticultural Society*, and referred to before, is as follows: "The boxes or vessels are placed in the back sheds of the hot-houses, or in any other house where no damp nor frost can enter. There should be several boxes, a part only being filled at a time, so as to keep a rotation of crop, and to have mushrooms at all times ready for the table. Suppose three boxes to be filled at a time, each of which is three feet long, one and a half broad, and seven inches in depth; then let each box be half filled with horse-dung '*droppings*' from the stables, the fresher the better, and if wet, to be dried for three or four days before it be put in the boxes, the dung to be well beaten down in the boxes. After the second or third day, if any heat has arisen in the dung, it is then a fit time to spawn; break each spawn-brick into three parts, as equal in size as possible, then lay the pieces about four inches apart upon the surface of the dung in the box, on which they are to lie for six days, when it will probably be found that the side of the spawn next to the dung has begun to run in the dung below; then add an inch and a half more

of fresh dung upon the top of the spawn in the box, and beat it down as before-mentioned. In the course of a fortnight, the box will be ready to receive the mould on the top; this mould must be two inches and a half deep, well beaten down with the back of a spade, and the surface made quite even. But before the box be earthed over, it will be proper to take up a little of the dung as far down as almost the bottom of the box, in order to ascertain if the spawn has run through the dung, if that has not taken place, let the box stand unearthed for some days longer, for were it to be earthed over before the spawn had run through the dung, the crop would be very scanty. In the space of five or six weeks, the mushrooms will begin to come up; if then the mould seem dry, give a gentle watering, the water being slightly heated before its application. This watering will make the mushrooms start freely, and render them of a large size. The boxes will continue to produce for six weeks, and sometimes for two months, if duly attended to, by giving a little water when dry, for they need neither light nor air."

This opinion is in unison with that of Nicol, Abercrombie, and most authors on gardening, but as mushrooms are produced naturally above ground, where they enjoy a sufficiency of both light and air, it is probable, that both contribute materially, in some way or other, to their perfection. If cut as button-mushrooms, each box will yield from twenty-four to forty-eight English pints, according to the season and other favorable circumstances.

The plan above described is preferred for yielding a number of mushrooms, and also where a great many are required, but their flavor is best when reared without dung. They are not then to be distinguished from those which grow naturally in the fields; but few are comparatively produced in this way. "I have," he adds, "lately found it very useful to add to every three barrow-loads of horse-dung, one of perfectly dry cow-dung, beaten down to powder as it were, and well mixed amongst the horse-dung, after the horse-dung has lain under cover for four or five days to dry." This addition of cow-dung was made in consequence of the effect it has to dry up the superabundant moisture in the horse-dung, and to render the

compost in the boxes more compact, as the closer the whole is pressed together, the better the spawn will run.

The same cultivator details his process of growing mushrooms in boxes without dung in the same memoirs, as follows: "Take a little straw, and lay it carefully in the bottom of the mushroom-box, about an inch thick or rather more. Then take some of the spawn-bricks and break them down, each brick into about ten pieces, and lay the fragments upon the straw as close to each other as they will lie. Cover them up with mould three and a half inches deep, and well pressed down. When the surface appears dry, give a little tepid water, as directed for the last way of rearing them, but this method requires about double the quantity of water of the former, owing to having no moisture in the bottom, while the other has the dung. The mushrooms will begin to start in a month or five weeks, sometimes sooner, sometimes later, according to the heat of the place where the boxes are situated. They do not rise so thick, nor of so large a size, nor do they continue to be produced so long as in the other plan with dung."

The Rev. W. Williamson, in Hort. Trans., spawns his melon-beds over after the violent heat has subsided, and obtains a crop of mushrooms in autumn. The essence of that paper is as follows:—The spawn is introduced upon the surface of the bed, and on the side of the hills, as soon as the violent heat is over; the whole process of the culture of the melons is, as if there were no spawn in the beds. The mould is laid on the usual thickness, and, as usual, of a strong loamy nature, and well beaten or trodden when put in. The spawn remains to run or extend itself all over the bed till autumn, when the melon crop is over. The surface of the bed is cleared of the vines and weeds, and the glasses put on and kept close; when the mould appears dry, water is frequently, but moderately applied, and the bed is exposed to fine warm showers. The watering and shutting up produces a slight fermentation in the old materials of the bed, and this slight heat tends to the production of mushrooms in abundance. When the coldness of the season prevents the growth of mushrooms, the frame and lights are kept on till spring, when they are re-

moved, and the bed covered with straw. The genial showers of spring cause the mushrooms to be produced again in considerable quantities, until the droughts of summer render it difficult to keep the bed sufficiently moist for their production. Sometimes the beds are allowed to remain undisturbed, and in such cases, produce crops the second autumn; but more generally they are taken to pieces, and the spawn collected out of them, and reserved for future beds.

It is conjectured, and we think with every chance of success, that such beds might be made to produce crops during winter, by the application of moderate linings of well-prepared dung, sufficient to repel the frost, and keep the spawn in an active state. It will be necessary, in applying water during winter, to have it rendered moderately warm, but little of that element will be found to be necessary, the steam produced from the bed being almost sufficient.

Mr. Hogan, in Hort. Trans., recommends growing mushrooms on hollow ridges. "The exterior form of my bed," he says, "resembles the old ones as built against a wall; but, instead of building it solid, it is hollow. Strong stakes are inclined against the wall, at an angle of about 65 degrees, on which hurdles are placed to support the bed. By this means a cavity is formed under the stakes between them and the wall and floor, for the purpose of receiving dung, which, being readily changed, (the ends of the cavity being open,) an opportunity is thus afforded of keeping up a permanently moist heat in the bed, the absence of which, together with an insufficient depth of mould for the spawn to run in, is the great defect of all other modes of raising mushrooms with which he is acquainted. On this structure, fourteen inches of rotten dung, and four inches of loamy earth, were laid and beaten firmly, and the spawning, and other processes and results, were the same as usual." From this mode, says an enlightened horticulturist, we fear two evils:—"Occasional over-heating and over-drying, either of which is ruinous to the mushroom. But, in our practice, we have succeeded in producing very good crops by the same process, but as our bed was constructed within an old vinery, probably the necessary humidity of the house counteracted one of the evils feared, and the

warmth of the house rendered the application of much heat from below unnecessary.

In the whole culture of the mushroom, it is absolutely necessary, in order to ensure final success, to guard against overheats, and too much moisture; the effect of the beds becoming dry only retards the production of the crop, without lessening the chance of their appearing in abundance when rendered sufficiently moist, and as it is always easier to apply water than to dry the beds, it is better to err on the safe side. The more compact the whole bed, together with the mould, can be made, the stronger will the spawn run, and the less liable will the beds be to become suddenly too moist or too dry. The greater the depth of material, the more juicy and productive will the crop be, and the more they are exposed to the action of air and light, the finer will their flavor be.

COLEWORTS.

Some of the colewort-plants which are the forwardest in their growth, and which were sown about the end of July, may, about the beginning or before the middle of this month, be transplanted into the places where they are intended to remain for spring use.

A sheltered part of the garden must be chosen in which to plant them out, where they may be protected from the influence of the sharp cutting winds of winter. They should be planted in rows about seven or eight inches apart, and the rows should be ten inches or a foot distant from each other.

Some of these plants will be fit for the table at Christmas, although the sowing may have been principally intended for the use of the ensuing spring.

CABBAGE-PLANTS.

The cabbage-plants which were sown about the middle of August for an early crop in the ensuing summer, should, towards the middle or latter end of this month, be pricked out on nursery-beds.

A piece of good ground should be allotted for them in a well sheltered situation, which should be well dug, and divided into beds of about three feet and a half or four feet wide.

The plants must be regularly pulled from the seed-bed, preferring those which are the most luxuriant in their growth, and leaving those of lesser growth to remain a fortnight or three weeks longer.

Set the plants in longitudinal rows on the bed, about four or five inches asunder, allowing about half a foot distant from row to row. Close the earth well up about their stalks, leaving the surface smooth and even between the plants.

The planting being finished, give the plants a moderate watering, which, if the weather be dry, should be repeated three or four times for the first week or ten days, after which time, the plants will have taken pretty good root.

BROCCOLI.

About the first or second week of this month, the last crop of broccoli should be transplanted where they are intended to remain to produce their heads.

A piece of ground should be prepared for them in a warm situation, and they should be planted in rows about a foot and a half apart; and about the same distance from each other in the rows.

All weeds must be destroyed which may have sprung up between those rows of broccoli which were planted out in any former months; hoe the ground, and draw the earth up round the stalks.

LIFTING THE CROPS OF ONIONS.

It is now time to take up the full crops of onions, for after the middle or the end of this month, they will advance little in their growth; they must be spread thinly on the ground, and if the weather be rainy, it were more advisable to remove them to a gravel walk, or to a space covered on purpose with sand or gravel, and exposed to the full influence of the sun. They must be turned over regularly once or twice a day, until

they be thoroughly dried, and then stored away in any well aired loft, barn, &c. If they be here spread thickly, they must still be turned occasionally; or they may be strung up by the tails, or hung in nets. If it be not intended that the onions should be strung, the better plan then is, before they are housed, to deprive them of the tails and outer husks, especially the latter, the greater part of which comes off by the simple process of rubbing.

TRANSPLANTING LETTUCES.

About the close of this month the different sorts of lettuces, the seed of which was sown about the middle or the latter end of August, and which were intended for the service of the ensuing spring, should be planted out into the borders, where they are to remain for use.

A warm border, under a southern wall or fence, should be prepared for them, and in digging the ground, the border should be laid in a sloping direction towards the sun, and its surface afterwards smoothly raked. Some of the best plants must then be chosen from the seed-bed, pulling off all decayed and broken leaves, and giving a partial trimming to the extremities of the roots, place them in longitudinal rows about five or six inches distant from each other, allowing nearly the same space between the rows.

If they survive the winter, one half of them may be thinned out regularly in the spring, and transplanted into a more open situation, leaving the remainder in the border to cabbage early.

If lettuce-seed were not sown in the month of August for the above purpose, it should not now be longer deferred; the first week of this month will be sufficiently early, provided the situation be warm and sheltered.

LETTUCES FOR WINTER USE.

Towards the latter part of the month, the lettuces required for winter use should be planted in beds in the driest part of the garden, and well exposed to the sun; the beds should be in every respect of the size of a cucumber or melon-frame,

for the purpose of admitting them to be readily covered in bad weather.

In these beds some of the best seedling brown Dutch, or common cabbage-lettuces, should be planted, at about the distance of seven or eight inches apart each way, and as soon as the weather begins to be cold, place the frames over them and cover them occasionally with the lights, or some close covering, when the cold is severe.

Some of these plants will be fit for the table by the latter end of December, provided that the season has not been very severe, and that a proper course of management has been pursued with them. In January and February they will be tolerably well cabbaged, and in March will be in high perfection.

SOWING LETTUCE FOR FRAMES.

About the middle, or any time before the end of this month, some of the different sorts of lettuce-seed should be sown for the purpose of planting in frames in October, to come in use in the spring and the early part of the summer. In very wet weather, they should be sheltered by drawing glasses over them, or any other appropriate covering; and if those which are to be transplanted now into the open borders should be destroyed, those sown at this time will be ready to supply their place.

The sorts most proper for this sowing are the Silesia and brown Dutch, the latter sort in particular; the seed should be sown on a bed of rich earth, situated in a warm exposure.

SMALL SALADING.

The different kinds of small salading should now be sown every eight or ten days, the sorts principally required are mustard, cresses, and rape.

It will be necessary at this time to sow these seeds in a warmer situation than in the preceding months, and the ground prepared for them should be light and rich.

Towards the middle of the month some of these seeds may be sown on a warm border under a southern wall, or a fence having a southern aspect.

If the weather prove wet and cold at the end of the month, some of each of the above-mentioned sorts should be sown in frames, and covered occasionally with lights, or they may be sown under bell or hand-glasses, for unless they be covered in cold weather, particularly in cold nights, they very rarely arrive at any degree of perfection.

Experience has shewn that these plants flourish best when sown in drills, which should be very shallow, nor should the seeds be covered more than a quarter of an inch, which should be done with light earth, or they may be left uncovered, and will succeed equally well.

WORK TO BE DONE IN THE CULINARY GARDEN.

Remove all decayed leaves, haulm, and stems, and the remains of all crops which have been used, so as to preserve order and neatness, and make way for winter crops, or winter fallows.

Destroy insects and vermin of all sorts; save all sorts of seeds that may be ripe; keep all the walks in, and entrances to the garden, in a neat and orderly manner.

All vacant ground, as soon as the crops are removed, should be trenched, where it is necessary, and rough dug, where trenching is not necessary; but let this only be done in dry weather, and when the ground is in a fit state.

Prepare ground for crops of onions for next year's sowing: for this purpose, make choice of the ground that they grew upon this year, but if there be any reasonable objection to that, choose another piece. Let it be well manured with very rotten dung, or rather with a compound of rotten dung, decayed vegetable matter, and fresh loamy mould. Let this be spread equally on the surface, and then dug in to an ordinary depth; lay the surface up as roughly as possible, so as to present as much surface as possible to the action of the winter's frost: this will be in good state by next spring for pointing over, and sowing the seed.

OCTOBER.

SOWING PEAS.

Peas for the early crops of next year may be sown about the end of the month, choose a warm south border fully exposed to the sun. The sorts to sow at this time are, the true early frame, Charlton, nimble taylor, and hotspur. Sow either across the border, or longitudinally, according to the width of the border; or sow one row longitudinally, about four feet from the wall, and plant a row of beans three feet in front of that. By this means, the one will not much shade the other, nor will either shade the wall-trees. By sowing longitudinally, the pea hand-glass, already described, can be used with more propriety. Observe, as has already been directed, to sow on the surface, and cover only about three inches deep; or if the soil be cold and wet, it were better to draw the mould up into small ridges a foot in height, and sow on the top of them. Or, to make ridges two feet high, and sow one line on the north side of the ridge, and another on the south. This is to be understood, when the lines run longitudinally and not across the south border. Should both rows stand the winter, the one on the north side, when sufficiently strong, may be transplanted to another border, or other sheltered place.

A few early frame, nimble taylor, or any other approved sort of early pea, may be sown towards the end of the month in a sheltered spot. They should be sown thick in a bed, and when the weather sets in severely, they may be covered over with a frame and glasses, or other more convenient shelter, occasionally during winter. In spring they will be fit to transplant out into rows in the borders. In cold damp situations, peas will by these means stand the winter where they would not in the open ground. Pieces of turf may be placed under them, when sown, as recommended by Messrs. Bishop and Bisset, to facilitate their transplantation. Or peas of any of the above sorts may be sown in shallow boxes or pots,

and protected during winter in a similar manner. Peas thus treated will come into fruit sooner by some days than such as stand out all winter, and, with little trouble or protection, will stand the severest frosts.

SOWING AND TRANSPLANTING LETTUCES.

The lettuce-plants raised from the seeds sown in August or beginning of September will be now stout plants. These should be now planted out where they are to stand the winter. A dry sheltered warm border should be prepared for them, by being neatly dug, in which the plants should be planted eight or ten inches apart. If the winter be mild, they will come into use in December and January, and continue good longer, if occasionally sheltered in bad weather. Sloping banks are formed by those persons, who depend much upon this crop during winter and early in spring, upon which the plants are planted rather thickly together, as they will be afterwards gradually thinned for use. In damp situations, and in cold heavy soils, this is a good practice, as these plants would do little good without this or a similar protection. In light sandy soils and warm situations, the hardier kinds of lettuce will stand most winters without any protection whatever. The plants for late autumn use should not be transplanted, but left where they grew, to be cut as they arrive at a proper size. They should, however, have the earth well stirred up about their roots, and all weeds and decayed leaves removed, as well as all useless plants, and thinned out to nine or ten inches apart. Where frames and glasses, or hand or bell-glasses are to spare, they may be now filled up with lettuce-plants, both of the August and September sowings. The larger of the former sowing may be forwarded in size, as the glasses can be kept upon them when necessary, never, however, omitting to give plenty of air to prevent them from being drawn up weak. The plants of the latter sowing should not be covered, unless in very cold or wet weather; the less protected that they are in autumn, the better will they stand the winter. Lettuce may also be planted at the bottom of the garden-walls, where they often survive the winter and come into use in spring, when those in

frames have been used, and those in the open borders lost. A small sowing of the hardier kinds may be made in a sheltered spot: should they come up and stand the winter, they will be extremely useful in spring, affording a crop between those which have withstood the weather, and those which are to be sown for the earliest spring-crops.

In preserving lettuce, or any other crop, through the winter, it is a particular point in the management, that they be kept completely clear of weeds, dead leaves, and every thing that would induce a state of damp or decay. Coal-ashes have been found useful when sprinkled between the plants to about the thickness of three-quarters of an inch, these having a tendency to absorb moisture, render the air round the plants less humid, and tend also to keep off the slugs in autumn. We have tried pulverized chalk for a similar purpose, without observing much difference in the effect.

BLANCHING ENDIVE.

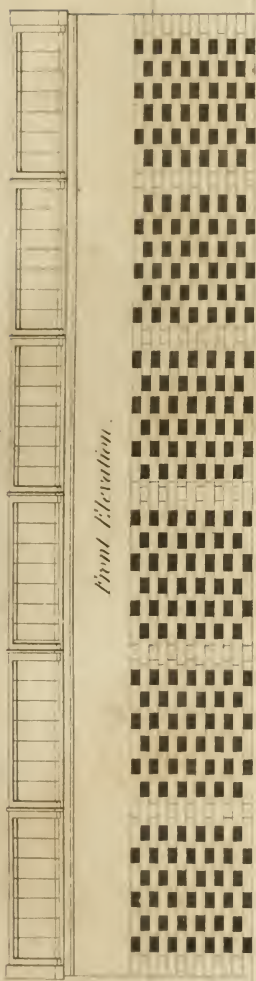
As the plants of endive attain their full size, they should be blanched, in which state only can they appear at table as an ingredient in salads. However, for some culinary purposes, they are often used without being blanched. Many are the ways by which gardeners whiten or blanch endive; the most primitive probably was merely tying up the leaves with pieces of bass, this is still often practised, and answers the purpose in proportion to the attention that is paid to the process. Others cover the whole plant while growing with a slate or tile, and many cover them in rows by placing two boards edgeways, so as to meet at their top. Some, after tying their leaves up, cover them nearly over with mould, sand, saw-dust, &c.; while some cover them with inverted flower-pots, having the holes in their bottoms stopped; this is an expeditious and commodious method, as the plants are kept dry, and the progress of the blanching can be easily examined. But the most effectual and better way is to have blanching-pots for the purpose. These pots are made similar to those used for blanching sea-kale, but only a foot in diameter, and six or eight inches high, having a knob at their top, by which

PASSIFLORA EDULIS.



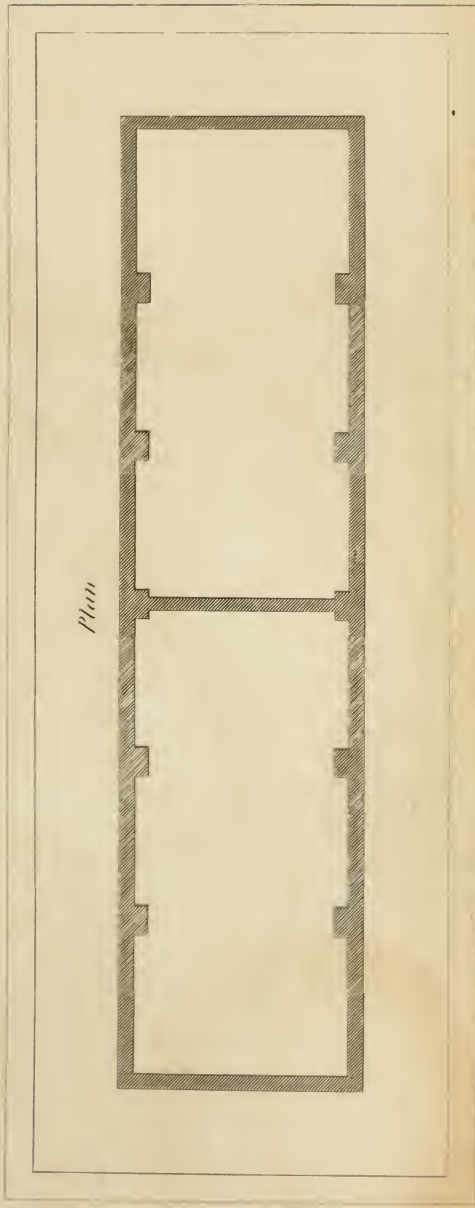
Drawn by J. T. Hart,
at the Physic Gardens Chelsea.

111. - 7100. - 111



Front Elevation.

30 Feet
20
40



Plan



they are removed with greater facility. Sea-kale pots are also often used for this purpose, and answer equally well, as far as the blanching of the crop is concerned, but they are less convenient from their greater size.

In whatever way endive is blanched, it is of the first consequence that the plants be perfectly dry before the process commences; to ensure this, they should only be covered in the afternoon of dry days.

PLANTING ENDIVE FOR WINTER AND SPRING USE.

Endive should still be planted for a successional crop, and at this season, a dry and sheltered situation should be chosen; but, when the situation or soil is damp, banks or ridges should be thrown up, on which to plant them. The steep sides of asparagus-beds are often planted with endive and lettuce by the London commercial gardeners, who find them, by such means, to stand the winter well. They also raise banks three feet, and often more, in height, upon the sloping sides, on which they set the plants. Private gardeners, who have much less ground, often fill their spare cucumber-frames, or pits with endive, in which they remain during the winter, and are blanched at the same time.

SOWING CARROT-SEED TO STAND THE WINTER.

In favourable situations, carrots are found to stand the winter, and when that is the case, they come in as a useful vegetable in spring, long before those sown for general crops are fit for use. It is needless to say, that the warmest situation should be chosen for this crop. As the chance of their standing is precarious, and as they are to be used when very little, a small spot of ground will be sufficient for an ordinary family, as they may be sown very thick.

TAKING UP AND STORING POTATOES FOR SEED AND WINTER USE.

Potatoes should now be taken up in dry weather, if sufficiently ripe, and stored by for winter and spring use. Potatoes intended to be eaten, probably cannot be too ripe, as we sus-

pect that a greater portion of better prepared fecula abounds in them, than in such as are taken up before they are fully ripened. Such, however, as are intended for seed, it has been stated, should not be allowed to become too ripe, as, in that case, they are more subject to the disease called the *curl*, which is often very detrimental to the crops. In taking up potatoes, whether for eating or seed, it cannot be denied that by far too little attention has been paid to keep each sort separate. Cultivators, generally, make little distinction between the kinds, no farther than merely keeping such as they term early potatoes, separate from the late ones. But, amongst the latter, there are many varieties better calculated for keeping than others; these should be kept separate, and those sorts used first, which are not found to keep so well. It is necessary that they should be taken up when the ground is perfectly dry, more particularly in damp strong soils, and either housed in places for the purpose, or piled up on dry ground in a conical form, and covered a foot thick with straw, and then a foot of mould placed over it, leaving the surface of the whole as smooth as possible, the better to throw off the rain. This is the general practice in Scotland, where much attention is paid to this valuable root. But we have seen, in chalky countries, excellent potato-houses cut out of the solid chalk, in situations where there was no chance of their being injured by damp or under-water, such houses being roofed over, and the roof only being above the surface, preserved them well for a great length of time. In such houses, there are often separate divisions formed of boards, into which the potatoes are placed, each kind by itself, and were potatoes buried in deep wells sunk on purpose, and perfectly dry, they might, probably, be kept for some months longer than in the usual ways.

TAKING UP CARROTS.

Carrots, when left too long in the ground, are liable in some soils to be attacked by worms; for this reason, and their being more readily got at during winter, they are taken up at this time. In taking them up, they should not be broken nor wounded with the tools employed for that purpose. Their

tops should be cut off about half an inch above the root: they may be stacked in a shed or spare house in dry sand, laid in layers of roots and sand alternately; or, they may be stored in the open ground as directed for patotoes (*which see*).

TAKING UP PARSNEPS.

The parsnep is a native of many parts of this country, as well as the carrot, therefore both will remain in the ground uninjured by frost. The difficulty of getting them out of the ground during frost, induces us to take up a portion of them in autumn. They are stored in the same manner as carrots. (*See the foregoing article.*)

PRICKING OUT CAULIFLOWERS.

The cauliflowers sown in August or the beginning of September, will now be fit to prick out in beds, where they are to remain during the winter. For this purpose, prepare a piece of ground in a sheltered, but not a shaded situation, of the size of one or more garden-frames: having sufficiently dug the ground, which should be well broken with the spade, proceed to set the plants in regular distances, of about four inches apart each way. When they are planted, give a watering to settle the mould about their roots; place a frame over them, if such can be spared, and cover them with the glasses for a few days, until the plants have taken root. Afterwards expose them as much as the state of the weather will admit, only covering them, when there is the appearance of frost or continued rains. Keep them clear of weeds and dead leaves, and guard against the attacks of slugs and mice. Cover the surface of the ground with coal-ashes, or fine sharp sand, which will resist the damp. If the convenience of frames be not to be had, prick them out in the same way under a wall or pales, sloping the ground in the process of digging towards the sun. Or, they may be protected in beds on a warm spot, covered occasionally with mats, supported by hoops. In either case, let them enjoy a free circulation of air, and be kept as dry as possible.

STORING CAULIFLOWERS.

Cauliflowers may be preserved for a considerable time by various methods. About the end of the month, pick out all those which are close, and well shaped; lift them carefully with a spade; dress off most of the leaves above the flower; remove them to an open shed, and lay them in by the heels, as it is called, among rotten tan, or dry mould, place them closely together, but not so as to touch one another. In this state, if kept free of damp, they will continue good for some time after those in the open air are exhausted. They may also be carefully taken up, and stored in the same way in the borders of any peach-house, or vinery, observing to shut up the lights during rain, and also on frosty nights. They may be also protected in deep garden-frames, or they may be taken up in a dry day, and carried to an airy shed, and tied in pairs, and hung up on poles or strong nails, with their heads downward; or they may be cut over about six inches below the flower, and a few of their leaves left to be wrapped round them, and buried about eighteen inches below the surface in a dry bank, or among sand in a cellar, or other house.

The most successful method we have practised for preserving cauliflower in perfection through the winter months, is to cut them in dry weather; dress off all their leaves, place them in an airy place to dry for a day or two, then bury them in casks, or boxes, amongst bog-mould. The best sort of bog-mould for this purpose is that, which is composed of vegetable matter, principally such as is generally dug for fuel. This sort is antiseptic, and capable of resisting putrefication, particularly when excluded from atmospheric air. A stronger proof cannot be adduced, than the many vegetable bodies which we see constantly dug out of this matter in a state very little changed from their original; although, in many cases, they may have been deposited there some hundred years ago. The mould which is used for cultivating heaths, and other tender-rooted plants, and which is generally called bog-mould, is not so fit for this purpose as the former, probably this sort should be denominated heath-mould, being always found on the surface of uncultivated heaths, &c. The heads or flowers

of cauliflowers preserved in this way, should be well washed previously to using, as they become black when buried any length of time; not that such blackness proceeds from any decomposition of the heads, but arises from the more subtile particles of the mould adhering to their surface.

PLANTING BEANS.

About the middle or end of this month, plant some beans to come forward as an early crop in the ensuing summer; they will be fit for use about the end of May, or the beginning of June.

The mazagan bean is the best sort for planting at this season, on account of its coming in earlier than any of the other sorts, and although they be of low growth, yet they are plentiful bearers; they also possess the property of standing the winter better than almost any of the other sorts.

The best situation in which to plant them at this season is under some southern fence, in rows across the borders, which rows should be two feet or two feet and a half apart, planting them about three or four inches distant from each other in the rows.

It is the common practice with many gardeners, when they plant their beans for an early crop, to set them, in the first instance, pretty thick on a bed of good earth, and as soon as they have attained a moderate height to transplant them into the borders, according to the following manner. Let a bed of good earth be dug up in a convenient warm corner, then draw about two inches of the earth from the surface, and scatter in the beans pretty thick; after which, cover them with the earth which was drawn off the bed; or draw some drills across the bed with a hoe held flatways, throwing in the beans rather abundantly, and then immediately afterwards draw the earth regularly over them.

After the beans have come up, and have attained an inch and a half or two inches in height, they may be transplanted, when the weather is mild, in rows, according to the directions already given. Particular care must be taken that the earth be well closed about every plant, and then they will soon grow very

freely, and be sufficiently rooted to bear the winter's cold; or they may be left in their native bed till the spring, and then transplanted, protecting them through the winter with mats, or frames with glasses.

The principal reason for adopting this method is, that it is generally allowed that those beans, which are transplanted, will come in sooner by a week or a fortnight, than those which are planted where they are to remain, at the same time that their produce will be greater.

LIFTING AND STORING BEET.

The crops of red beet should, at the close of this month, be taken up and laid by for winter use. For this operation, it were advisable to choose a dry season, and the greatest care must be observed in lifting the roots, to prevent them bleeding at the wounds which they may have received. Some dry sand should be procured, and the roots placed in it, in some shed or cellar beyond the influence of the frost. It is the practice of some persons to let the beets remain in the ground, and in this case, they should be covered, before the winter sets in, with litter or reeds, or peas or beans haulm. By this method, however, they are not only likely to rot, but also to lose their color from the influence of the rain. When the tops are dressed, the crown of the roots should be left about an inch long to prevent their bleeding.

TRANSPLANTING CABBAGE-PLANTS.

Towards the end of this month is a proper time for planting out early cabbage-plants, where they are to remain for cabbaging early in the following summer.

A spot of good ground should be chosen for them, over which some rotten dung should be spread before it be dug; then dig the ground one spade deep, burying the dung regularly in the bottom of the trenches.

If time can be spared, we would advise to trench the ground for this crop. As a considerable portion of every garden is

taken up with cabbages planted at this time, or early in spring, we would recommend to commence at one end of a quarter, or division of the garden, and to trench the ground for this crop, forming the surface into ridges, and as the operation proceeds, trenching to the depth of two feet or two and a half, according to circumstances. Give plenty of manure, and let it be regularly laid in the trenches, as the operator proceeds. When one trench is finished, set the plants in the bottom, or lowest part of the ridge, and in wet soils, a row may be planted on the top of the ridge. If both survive the winter, either may be removed to make up blanks in the whole, or removed to another piece of ground, preferring to leave the row in the lowest part of the ridge. When this first row is planted, proceed with another trench, which ridge up in the same manner, and plant the second row of plants, and so on until the whole piece intended be trenched and planted. By this means, the whole garden will be regularly trenched, and when the whole ground has been gone over in this manner, begin again, where the first operation commenced. In old gardens, when the soil has been long cropped with the brassica tribe, this is almost a certain cure for that disease, occasioned by grubs, and generally called, *clubbing*. The plants will be protected from cutting winds, and grown in a fresh soil; the eggs of the grubs will be buried, probably, beyond the possibility of their again visiting the surface, at least for some time. If this, or a similar rotation, were more generally adopted, less injury would be done by these and other insects. The various varieties of brassica would then follow in crops of regular rotation, as they seldom succeed, if planted twice on the same ground.

The plants should be set in rows about two feet apart, allowing about the same space between the rows, which is sufficient room for this early plantation.

Some of the early cabbage-plants should, however, remain in the nursery-beds till January or February, when they are to be planted out permanently, for it frequently happens, in severe winters, that many of those plants, which are set out early in a more open exposure, are destroyed by the frosts; should this take place, then have recourse to the nursery-beds to supply their places.

If any cabbage-plants still remain on the seed-bed, remove them into nursery-beds about the beginning of the month, in order that they may gain sufficient strength to endure the ensuing frosts.

WINTER SPINACH.

If, at this season, the spinach-beds be not kept exceedingly free from weeds, they will soon outgrow the plants and totally choak their growth. The better plan at this season is to clean them by the hand, because they are now principally covered with running weeds, such as chick-weed, &c.

If the spinach were omitted to be thinned out last month, it should be done, as soon as possible, the beginning of the present, always clearing away the worst of the plants, and leaving the remainder about five inches apart.

EARTHING UP BROCCOLI AND BRUSSELS-SPROUTS.

The crops of broccoli should now be cleared from weeds; and finally moulded up for winter about the middle or latter end of the month; a dry day should be chosen for the operation. The crops of Brussels-sprouts may be treated in the same manner.

DRESSING ASPARAGUS BEDS.

Some time in this month cut down the stalks of asparagus and dress the beds. The stalks should be cut down quite close to the surface of the beds, after which the weeds should be hoed clean away, and drawn into the alleys. Having then stretched a line, mark out the alleys with a spade about twenty inches or two feet wide, according to the original width which was allowed them.

Then proceed to dig the alleys about a spade deep, spreading the greater part of the earth over the beds in a neat and regular manner; and accordingly as you dig the alleys, bury the weeds regularly in the bottom of the trench, covering them with a sufficient quantity of earth. The edges of the beds

should be formed full and straight, and the bottoms of the trenches be made level and smooth.

If it be intended to manure the beds at this time, let a sufficient quantity of rotten dung and fresh rich loamy earth be prepared, by being well mixed and incorporated, with which to top-dress the beds, and which should be laid on them to the thickness of two inches, and over this should be laid an inch in thickness over the beds, of mould taken from the alleys between them.

Or a quantity of good rotten dung may be procured, such as is taken from old cucumber or melon-beds, and this should be spread over the asparagus-beds, as soon as the stems and weeds are cleared away. The dung should be well broken and laid on of an equal thickness, after which dig the alleys, and lay a small quantity of the earth over the dung.

The beds being thus prepared, plant in each alley a row of colewort or cabbage-plants, at about eight or nine inches apart in the rows. These plants often survive the winter in the severest frosts, when all those have been destroyed which were planted on a level spot. If it be preferred, a row of early garden-beans may be planted in each alley.

ASPARAGUS FOR FORCING.

Asparagus-plants which are intended for forcing, should also now be cut down, the weeds drawn into the alleys as directed before; bury the weeds, and as you proceed throw a little mould over the beds.

Those plants, however, which are intended for forcing this winter, need only have the stalks cut away, and covered with leaves or long dry litter, to enable them to be taken up in time of frost.

SEEDLING ASPARAGUS.

Seedling asparagus-plants, which were sown last spring, should at this time also have a little top-dressing, such as clearing the bed from weeds, laying a little rotten dung over it, &c.

EARTHING UP CARDOONS.

This work must be done in dry weather, and at a time when the leaves of the plants are dry.

Observe at every time that these plants are earthed up, to tie the leaves together with a hayband, then, breaking the earth well, lay it up the sides at an equal thickness about the plants.

EARTHING UP CELERY.

As it advances in height, celery should be constantly earthed up, that the plants may be well blanched before the hard frosts come on. In dry days, therefore, proceed to this work, breaking the earth well first, and then laying it carefully up to the sides of the plants, without burying their hearts.

LIFTING AND STORING SALSIFY, SCORZONERA, AND SKIRRET.

These herbs may now be lifted and stored for winter use, in the same manner as directed for carrot.

SOWING SMALL SALADING.

Chervil and cresses may still be sown. The sooner now, however, the better, that they may get established before the winter sets in.

At the bottom of a south wall, sow a supply of Normandy or curled cress; it will, with little protection, afford a fine salad during the winter, and come in early in spring.

SOWING RADISH.

Sow some of the different sorts of radish in a sheltered situation. They may perhaps come in about Christmas, and if they do, will be useful. If they should fail, the value of the seed is trifling.

WORK TO BE DONE IN THE CULINARY GARDEN.

All vacant pieces of ground should now be either trenched or dug deep, leaving the surface as rough as possible, or ridged up in long narrow ridges, so that the frost may penetrate through it. This operation of winter fallowing, either by trenching, digging, or ridging, is of infinitely more importance to garden-ground than all the manures that can be given it without.

Clear away all decayed leaves, and dig them into the ground or carry them to the compost-yard for vegetable mould. If a garden be thus laid up in fallow, it will have a neat and orderly appearance all winter, and will be contemplated with more pleasure by its owner than if left in that state of neglected confusion, in which we generally see kitchen-gardens at this season. It will be a saving of labour to the gardener in spring, as well as materially improving the soil. In strong clayey wet soils, this is of the utmost importance, and few gardens are so light and sandy as to be injured by it.

Heaps of different sorts of compost for manure should be turned over, and properly mixed, but this should be done in dry weather. Draw in fresh loam, turf, and other such like matter, to incorporate with dung, and be not sparing in collecting such materials. Composts thus prepared are always better than rank dung; too much, therefore, cannot be collected, and no season of the year is better adapted for that business than the present.

NOVEMBER.

PLANTING BEANS.

Beans for early spring crops should now be planted, for which, see *last month*.

Any of the early kinds of beans, the mazagan in particular, may be sown thickly in a bed, (*as directed last month*), and occasionally protected. They will be fit to transplant out where they are to perfect their crop in spring.

SOWING PEAS.

This is a good season for sowing peas. Those sown this month will be equally early with those sown last month; it is, however, best to sow at both times. (*See last month*.)

COVERING UP ARTICHOKEs.

Artichokes should now be covered up, before the winter sets in, with peas-haulm or stable litter, as they are very liable to be injured, if not totally destroyed by severe frost. The decayed stalks must be first cleared away, and also the bulk of the leaves. The litter must be laid along the rows, sufficiently broad to cover the roots, according to the size of the stools, and about the thickness of a foot, and it should be trodden or beaten well down with the fork to prevent it being blown about.

Leaves of trees, which will now be in abundance, make a good covering, but are apt to blow about with the wind. As a preventive, however, cover first with leaves, and then add a little litter upon the top, and for greater security a little mould may be put over all. The best covering for artichokes is rotten tan, when no longer useful for fermentation.

TAKING UP CARROTS, PARSNEPS, BEETS, &c.

See *last month*.

SAVING TURNIP SEED.

When it is intended to plant turnips for seed, some of the best formed roots should now be selected. They should be planted deep, in rows two feet apart, and at a distance from any other plants of the same family, to prevent, as much as possible, the hybridizing of them with the pollen of other kinds.

SAVING CARROT SEED.

The largest and best-formed roots, free from canker or worm, should be made choice of, and at this time planted in rows two feet apart, and planted deep, so that their crowns may be at least two or three inches under ground. In gathering the seeds, prefer such as are produced from the central or principal *umbel*, from which may be expected the finest seed, and the strongest plants.

SPINACH.

Beds of spinach should now be kept perfectly clean and free from weeds; and if the plants stand too closely together, draw up the smallest of them for present use, thinning them in such a manner as that each plant may stand singly.

If this be done, and in proper time, the sun and air will penetrate more easily amongst them, and will dry the surface of the earth, which is of great advantage to the plants, and will cause them to grow and thrive the better.

In gathering spinach, the following directions should be attended to, viz. to cut off only the outside larger leaves, permitting the others to remain, which by that means will grow the faster, and be fit for gathering in succession.

COVERING UP CELERY.

The crops of celery, particularly the most forward, should be earthed up as far as may be judged necessary, and a quantity of fern, or long littery dung, brought to the sides of the

beds to be ready on the appearance of frost wherewith to cover the whole of them. They should be covered to the thickness of a foot or fifteen inches, but this covering should be always taken off, as soon as the frost is gone. By attending to this particular, celery may be preserved throughout the winter.

CAULIFLOWER-PLANTS.

The cauliflower-plants which are in frames should have free air admitted to them every fine day, by wholly removing the glasses in the morning, but at the approach of night, they should be again regularly covered.

When the weather is very wet, it will be proper to keep the plants covered with the glasses, but, at the same time, to raise them to such a height, as to admit the air to have free circulation over the whole of the bed.

Take away all dead leaves as soon as they appear on the plants, and keep them entirely clean from every species of weeds.

The cauliflowers under bell or hand-glasses, require just the same treatment as those in frames. It will be also of essential service to them to draw the earth up a little round their stalks.

Where cauliflower plants were neglected to be pricked out last month, let it now be done as early in this month as possible.

COVERING UP ASPARAGUS.

Asparagus, being indigenous to many of our sea-shores, is not so tender, as to require protection in winter. It is seldom, or never, that asparagus-roots are injured by frost. The practice of covering asparagus seems to be mistaken by many. The real use of covering it in winter is, not so much to protect its roots, as to manure the ground. For this purpose, therefore, good dung should be used, and not mere litter, or leaves, which is the practice of some persons. Previously to laying on the dung, the surface should be carefully forked up a few inches deep to allow the juices of the dung to penetrate more readily to the roots. Asparagus-roots yield a great bulk of vegetable matter in the course of the season, therefore this

must exhaust the ground on which it grows; and, being a perennial plant, not often renewed by sowing, or planting, it requires a proportional quantity of good manure to support it. Salt is a good manure for asparagus, the subtile particles of which penetrate to a great depth. This should, however, be used with discretion.

Good stable-dung, which has not been exhausted in hot-beds, should be chosen, and put on in quantity according to its quality, from six to twelve inches. The rains, in winter, will wash the juices of the dung down to the roots. Where seaweed can be procured, it is probably the best manure for asparagus; but where that cannot be got, salt may be used mixed with the dung: its parts will descend more gradually along with the juices of the dung, than when applied as a simple.

COVERING UP SEA-KALE.

The beds of young sea-kale, that are not intended to be forced, should be covered up as before directed for asparagus. Observing, first, to clear the ground of weeds, and to fork up the surface.

The beds intended for cutting in spring should be also forked up, and cleared of weeds, and covered from five to fifteen inches with leaves, which will now be in abundance; covering the strong and old roots thicker than the young and weak ones. A few branches, or old boards, may be laid over the whole, to prevent the leaves being blown away, and they will require no farther attention till spring, when they will be fit for cutting.

The beds of sea-kale intended for forcing, should also be forked up and covered with leaves, sufficiently thick to keep the frost out, and to render them more easily got at, when the operation of forcing is to commence: for which, see *Forcing Garden*.

CARDOONS.

Cardoons should now be finally earthed up, and protected as is advised for celery.

PLANTING LATE CROPS OF CABBAGES.

The planting of cabbages for next spring's use should now be completed as early in the month as possible, that they may become rooted before the growing season ceases. The best plants should be chosen for this purpose. The worst may remain in the seed-bed, and take their chance; if they survive the winter, they will be useful to make up vacancies in the crops planted out.

WINTER ONIONS.

The crops of onions sown to stand the winter should be kept clear of weeds. In dry weather, the ground between the rows should be hoed; and, if wet, the weeds should be hand-picked; as the onions increase in size, they may be thinned out for salads.

CARE OF WINTER SALADS, &c.

The crops of chervil, cresses, endive, parsley, and radishes, sown and planted as directed in the two last preceding months, should, in the prospect of severe weather, be protected with care; by covering them with branches of spruce or broom, and in very severe weather with mats. The most sure method is to have a supply in the forcing department, (*which see*,) particularly of the smaller sorts.

LETTUCE.

Lettuce-plants, which are under frames, should enjoy the free air daily, when the weather is mild and dry; the glasses should entirely be taken way in the morning; when the weather is wet or very cold, set them on again in the evening, but at other times they may remain off all night; when these plants are kept too close, they are apt to draw up weak.

In very wet weather, keep the glasses on, only raising them at the back of the frame, that the air may have a free course and be duly admitted to the plants.

When the weather is severe and frosty, the glasses may be kept close; other coverings also, if necessary by the extreme rigour of the season, must be made use of.

Where any of these plants have been placed under bell or hand-glasses, observe the same directions as before mentioned.

WORK TO BE DONE IN THE CULINARY GARDEN.

When the weather is dry, and time to spare, let such pieces of ground be trenched as require it: all other spare ground should now be rough-dug or ridged up to the action of the winter. Such crops as require to be protected during winter, should now be attended to. All rubbish and useless vegetables removed from the garden. Moulds, composts, and manures should now be collected, and mixed to be in readiness for the ensuing spring.

Roots of all kinds, intended to be preserved for winter use, should now be taken up and housed as directed in the last and former months, as after this time they will not increase in size, and some of them will be injured by remaining in the ground, particularly beet-root, which loses its colour; and carrots, which are apt to be attacked by worms when left too long in the ground; they are also more conveniently obtained when wanted for use, if packed in sand, straw, or otherwise, and are not injured by frost, which not only detracts from their flavour, but renders them less likely to keep for any length of time. Attention should now be paid to neatness and order as well as during the former months. The walks in and connected with the culinary garden, should be kept neat and clean, and in dry days they should be frequently rolled, to keep the surface even and agreeable to walk upon, as well as to keep down the worm-casts, which at this season are very troublesome, and if not swept off, and the walks afterwards rolled, give them a coarse and neglected appearance.

D E C E M B E R.

PLANTING BEANS.

If the weather will permit, plant beans as directed last month, but if the ground be not dry, defer this planting, till next month or until February.

SOWING PEAS.

Peas may be sown as directed last month, if the weather be mild and dry; if not, defer till next month. Look carefully over the crops of beans and peas already sown, and when mice or other vermin attack them, let them be destroyed by poison or traps. If this be neglected, they will soon destroy all the crops. Furze, or *Ulex europæus*, chopped small, and strewed over the peas in the drills, is often used to prevent the attacks of mice. The crops of beans and peas that may be above ground should be carefully examined in dry days, and the earth stirred about their stems, and a little drawn up to them, if necessary.

Unless in very severe frosts, avoid covering peas or beans this month with the pea hand-glass, or other means, as that would draw them up too tender, and render them less able to stand the frosts, which generally are more severe, particularly of late years, in January and February. Glass-cases are intended more to accelerate, than protect the crops. Hurdles may be placed upright parallel to the rows; or pea-stakes may be put along the rows, which will partially protect them, without drawing them up too tender. In wet soils, a slight covering of coal-ashes will resist the damp, and not injure the crop, if not applied in too large a quantity. Where chalk can be had, a slight covering of it will greatly prevent the effects of damp, it corrects the acidity of the ground, and imbibes a great portion of moisture.

Mice are the greatest enemies that the gardener has to contend with in the rearing of early crops of beans or peas. Rats,

although more formidable, are not so generally found to destroy seed in the ground. The best modes of destroying mice, are certainly to have a few cats domiciliated in the back shades; they will keep a garden clear of these invaders. The next is, a slate or a brick supported by a combination of three slips of wood, forming the figure 4, and baited with a pea or bean, a piece of bacon or cheese; or, a brick may be used, by placing two pieces of wood in the ground, about five inches apart, each slit at the top, through which slits a stout thread is drawn, and a bean or pea fixed to the middle of the thread; the brick is placed, resting one end on the ground, and the other on the thread: the mouse, in attempting to take away the bean, cuts the thread, and the brick falls down upon it. This is, of all traps, the simplest, and soonest set. Several hundred of these traps should be set in different parts of the garden, particularly where mice are found to resort to. By looking over them once or twice a-week, and re-setting any that may have fallen, the garden will be kept pretty clear of these vermin. Rats are generally destroyed by poison, and most gentlemen have a person employed by the year to destroy them. But, in all large places, one of the stationary labourers should be instructed in destroying vermin of all sorts, and be paid either by the year, or so much per head for moles, rats, mice, and all birds or beasts, that destroy the fruits of the earth. This would be found the most economical and satisfactory way of getting rid of such enemies.

MUSHROOMS.

Be very careful now of mushroom-beds, to shelter them from the wet and sharp frosts. Lay a covering of clean straw, a foot or a foot and a half in thickness, over every bed; this will generally produce the desired effect. Dutch reed-mats are the best covering for mushroom-beds, and, if taken care of, will last for many years: these should be placed over the straw, and will be found completely to throw off the wet.

After heavy rains or snow, examine the beds; and if the covering next the beds be wet, remove it, and place in its stead the same quantity of fresh straw.

PROTECTING-FRAME DEPARTMENT.

Look carefully over the cauliflower, lettuce, cape broccoli, radishes, and salading of every description, that are under frames, hand-glasses, or other shelters. Remove all decayed leaves, weeds, or other rubbish from them; give plenty of fresh air in fine days, by removing the glasses, either wholly or partially, as circumstances may direct, and cover them from rains, snow, or frost, by adding a covering of litter, bass-mats, or reed-mats, as may be most convenient.

PROTECTING CULINARY VEGETABLES.

Protect celery and cardoons as directed in November, and lay some long littery dung over the roots of rhubarb, sea-kale, and asparagus, intended to be taken up to force in the forcing department. Protect endive in the borders by branches of trees, or in severe weather, by straw or reed-mats; also radishes and other salads, in the open borders, and crops of carrots for spring use. Parsley, and every other production of the garden that are likely to be destroyed by frost, should also be protected.

WORK TO BE DONE IN THE CULINARY GARDEN.

The operations of trenching, digging, and ridging, should be continued, if dry weather, if not, it were advisable to find employment for the men in some other department. Deciduous hedges may now be cut; any fences connected with the garden put in repair, if necessary. The onions and other roots stored, should be occasionally examined in bad weather, and all that show symptoms of decay, removed, before they contaminate the remainder. If frosty weather, wheel out manures of all sorts, and lay them in neat heaps in different quarters of the garden; it will save much time in the spring, when they are to be dug in; but, in doing this, by no means divide the manure in small heaps of a wheelbarrow-load each: this is the next thing to wheeling it into a river. Let each heap contain as much manure as is supposed will be

sufficient for the quarter, on which it is placed; put it neatly up, and cover it with a thin coat of mould, to prevent as little of its goodness escaping as possible.

ICE-HOUSE.

This is the season in which to expect materials to fill the *ice-house*; have it properly cleared out of all straw, or other filth, that may have accumulated in it; have beaters and rammers prepared for packing it, when either snow or ice is found in sufficient quantity to fill it. If the ice-house be built on a proper principle, either the one or the other will answer equally well. Snow, in fact, very much resembles ice, when well beaten in the house, and can only be considered in the character of ice. It answers all the purposes of ice in domestic cookery or confectionery, besides having this advantage over ice, that it is sooner collected, and packed in the house with less labour, and keeps equally well.

ICE-HOUSE AND ITS MANAGEMENT.

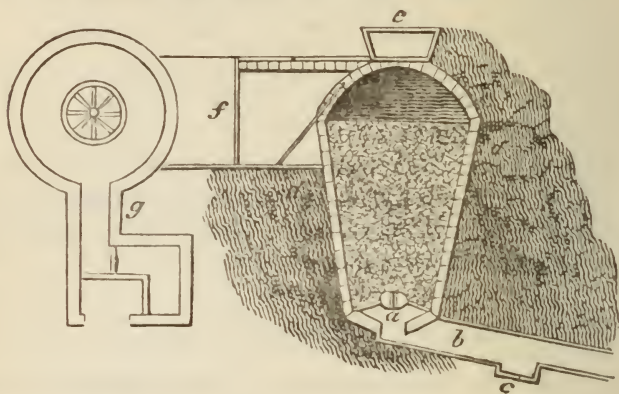
Ice, in the hot days of summer, is considered such a luxury, that few that can command it would like to be without. The situation for an ice-house should be chosen on a dry and rather



elevated spot of gravelly or chalky ground, and as near to a pond or piece of water as circumstances will admit of. If the situation be shaded by more elevated ground, so much the better, but if it be not naturally so, it may be rendered artificially so by planting. It must be, as much as possible, hidden

from the sun's rays. The form of our ice-houses is generally that of an inverted cone. The London confectioners, as well as most people on the continent, content themselves with keeping it in cellars, surrounded with very thick walls, and without windows, being entered sometimes by straight and sometimes by crooked passages, secured by double and often by treble doors, and the ice thickly covered with straw or mats.

The accompanying figure will give an idea of the general plan of ice-houses in this country.



In building the ice-house, a space of two feet or more should be left at the bottom (*a*), for receiving any moisture which may drain from the ice in the process of melting; from this space, a drain of brick-work (*b*), set in cement, the dimensions of which, however, need not be so large as represented in the accompanying sketch, and which is intended to carry the moisture to a considerable distance; this drain should have a stop or trap for the exclusion of air (*c*), and over the space at the bottom (*a*) should be placed a strong grating of wood, to let the moisture fall down, which may at any time proceed from the melting of the ice. The sides of the well (*dd*) must be walled up with brick or stone, at least two feet thick, or the wall may be built hollow. When the proper height is attained, the well may be arched over with two arches, with a vacuity between, and leaving in the centre a hole, for the admission of the ice (*e*); and in the sides, a door for taking it out (*f*). This door, the better to exclude the

air, should open into a porch (*g*) with the three other doors, the spaces between which should be filled with straw, to exclude more effectually the heat of the atmosphere. The whole being covered first with a covering of tempered clay, and next with a hill of earth. The appearance will not be disagreeable, as it may be planted with evergreens.

The exterior may be so decorated, as to become an object of ornament, should it be placed in any part of the dressed grounds.

The size of the house must depend on the quantity of ice which is wanted; but we would recommend, that, in making an ice-house, rather to make it too large than too small, as it sometimes happens that neither ice nor snow can be procured to fill it. Instances have occurred, that the London confectioners have had to import it from the polar seas. As snow or ice will keep, in a good ice-house, two and sometimes three years, it were advisable to have it large enough, and always to fill it when an opportunity offers, to guard against a casual scarcity. For an ordinary-sized family, a house about ten feet in diameter, and fifteen feet deep, will be sufficient; for larger families the house must be larger, or for smaller families, a well of six feet in diameter, and ten deep, may be sufficient.

FILLING THE HOUSE.

When either snow or ice can be got, begin by laying a good coat of straw on the bottom, and up part of the sides; if snow, throw it in, and let it be well beaten together, and so proceed, until the house be full. If ice, prefer the thinnest (that is, about an inch thick); break it as finely as possible, with clubs and mallets at the entrance; put it also in, and let two or three men be employed in the house, packing and beating it closely together with rammers. As the operation proceeds, sprinkle occasionally a little water over the whole, which will make it freeze together in a solid body. The whole art of keeping ice simply consists in packing it closely, and defending it from the action of atmospheric air.

The house being full, let the doors be shut up, and the spaces between each packed full of straw. For security,

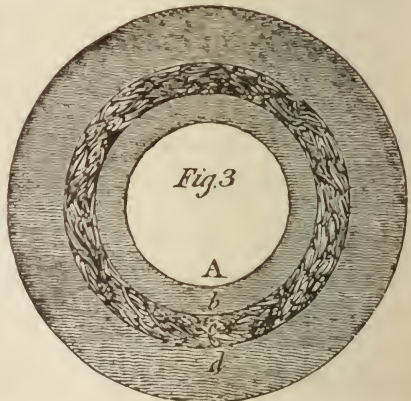
have the outer door locked, and the joints between the door and casement painted over with a thick coat of coarse paint, or strong lime-wash. It will be unnecessary to disturb it afterwards, until opened to take out the ice; care must be taken, every time that any be taken out, to have the doors all shut, and the spaces filled up again with the straw. It should be taken out as expeditiously as possible, and one person should carry the ice to the kitchen, or wine cellar, while another renders the house secure again.

When we consider the rapid progress which science is making, it is not improbable that a substitute may be found, grounded upon chemical principles, to answer all the purposes of ice in domestic cookery. An apothecary of Caen, in Normandy, is asserted to have discovered a method of procuring ice at all seasons of the year, by mixing four pounds of sulphuric acid (oil of vitriol) 36 degrees, with five pounds of sulphate of soda (Glauber salts in powder). This mixture must be made in an earthenware or china vessel, and the water which it is intended to congeal must be put in it, in a separate vessel, wrapped round with flannel, cotton, thick paper, or some other non-conductor of heat, and the operation must be repeated three times on the same body of water.

Some people put salt with the ice as the house is filling, but this is quite unnecessary; it will consolidate as well without it as with it.

TO KEEP ICE IN STACKS.

For those who have not the convenience of an ice-house, and yet are desirous of having ice at times, the following plan will be found to answer, and would be a great improvement to the shooting boxes or summer retreats of gentlemen, and could be obtained at a trifling expense. Prepare a cir-



cular elevated platform (A) about a foot above the level of the ground upon which pile the ice or snow in a conical form, during a hard frost, and add a little water, as the building goes on. Over this cone, wheaten or other straw is laid to the thickness of twelve or fifteen inches (*b*), over this a stratum of fagot-wood or heath (*c*), and then another stratum of straw of any sort (*d*); let this outer coat be of a good thickness, and well secured down with straw-ropes, similar to the way of securing thatch on wheat or hay-stacks; over the whole a coat of turf may be put. In this simple way, ice will keep all the summer well. Expose it to the air as short a time as possible, when any of the ice is taking out for use.

The use of ice has been long known among the nations of Europe. Daines Barrington says, that the Romans discovered the use of ice for cooling liquors at the time when they began to force fruits, and adds, as a singular coincidence, the coeval invention of these arts in England. He says, that Charles the Second had the first ice-house, and also the first hot-houses, ever built in this country. At the installation-dinner, given at Windsor, on the twenty-third of April, 1667, there were cherries, strawberries, and ice-creams. But Switzer thinks, that the uses of ice must have long before been introduced from the continent.

Various have been the methods adopted by gardeners for the preparation and keeping of ice during the hot months of summer, the complaint being general, that it melts away too rapidly; to obviate this defect, Mr. Young, of Wilford House, near Nottingham, has, in the *Gardeners' Magazine*, recommended the following method:—

In the months of December or January, when the water-pools are frozen to a sufficient thickness, say one or two inches, proceed to break the ice in pieces, and draw it off the water with iron hooks, conveying it to the ice-house in carts, as quickly as possible. Before throwing it into the house, three or four men should be employed to break it in small pieces, about the size of common road-metal. Then carry it into the house, where two men should be again employed in pounding it almost to powder. Lay the bottom and the sides of the house with a layer of wheat-straw, three

or four inches thick. After there are about two feet of ice thus pounded, take ten pounds of salt, and dissolve it in ten gallons of boiling water. When the salt is sufficiently dissolved, pour it on the ice through a common garden watering-pot; thus going on regularly every two feet, watering, and laying the sides with straw till the house is filled, finishing with a double quantity of the salt water. After it has been in eight days, and when it has subsided, fill up closely with small bundles of straw, to exclude all air as far as possible.

An ice-house filled in this manner will be found, when opened in summer, to be as firm as rock, and to require at all times the force of a pick-axe to break it up. It will be found to keep three times longer than the common method of filling ice-houses, and more suitable for being received from the ice-house for use, as it will keep three times longer when exposed to the air.

It appears, however, from a communication inserted in the same periodical, from Mr. Saunders, Gardener at Luscombe, in Devonshire, that a regular and plentiful supply of ice may be obtained without the aid of salt. The following is the method which he adopts:—As soon as the ice is frozen to a proper thickness, it is conveyed to the ice-house, where a sufficient number of men are ready to proceed to break it in small pieces; then they throw it into the house, where three or four men more are employed pounding it, till a sufficient quantity of powder is obtained to prevent any part of it being hollow. In this manner I proceed till the house and entrance, or passage to the house, is completely filled. The ice which the passage contains, furnishes a supply for six or eight weeks; at the expiration of which time the house is opened, and a quantity of straw taken into it, sufficient to fill the cavity that will then be found between the ice and the wall, and also to lie one bundle thick over the top of the ice.

THE
PRODUCTIONS
OF THE
CULINARY GARDEN
FOR THE YEAR.

JANUARY.

Cabbages of sorts (<i>if a mild winter</i>)	Spinach (<i>in mild seasons</i>)
Savoys	Sorrel (<i>in do.</i>)
Borecoles	White Beet (<i>in do.</i>)
Brussels-sprouts	Onions
Kidney or French beans for harricots, from the seed-room	Leeks
Peas for soups, from do.	Garlic
Potatoes	Eschalot
Jerusalem Artichokes	Rocamboles
Turnips	Lettuce
Carrots	Endive
Parsneps	Celery
Red Beet	American Cress
Skirret	Winter do.
Salsafy	Parsley, (<i>if protected</i>)
Scorzoneria	Horse-radish
Marjoram, dried	Fennel, dried
Savory, do.	Dill, do.
Mint, do.	Chervil, do.
Basil, do.	Thyme, green or dried
Anise seed	Sage, do.
Coriander do.	Rosemary, do.
Caraway do.	Lavender, do.
Mushrooms	Camomile, dried
Turnip-rooted celery	Samphire (<i>seldom cultivated</i>)
	Red Cabbage

FEBRUARY.

Cabbage of sorts (<i>if a mild winter</i>)	Jerusalem Artichokes
Savoys	Turnips
Borecoles	Carrots
Brussels-sprouts	Parsneps
Cabbage-Coleworts (<i>if a mild winter</i>)	Red Beet
Broccolis	Skirret
French or Kidney Beans for harricots	Salsafy
Peas for soups, from the seed-room	Scorzoneria
Potatoes	Marjoram, dried

Basil, dried	American Cress
Anise seed	Winter do.
Coriander do.	Parsley (<i>if a mild winter</i>)
Caraway do.	Horse-radish
Spinach (<i>if a mild winter</i>)	Fennel, dried
Onions	Dill, do.
Leeks	Chervil, do.
Garlic	Thyme, green or dried
Eschalot	Sage, do.
Rocamboles	Rosemary, do.
Lettuce	Camomile, dried flowers of
Endive	Mushrooms
Celery	Red cabbage

MARCH

Brussels-sprouts	Savory, dried
Borecoles	Turnips
Broccolis	Carrots
French Beans, for harricots, from the seed-room	Red Beet
Peas for soups, do.	Parsneps
Potatoes	Skirret
Jerusalem Artichokes	Scorzoneria
Onions	Spinach (<i>if mild weather</i>)
Welsh onions, from the open ground	Garlic
Lettuce	Eschalot
Endive	Rocamboles
Celery	American Cress
Parsley	Winter Cress
Horse-radish	Water Cress
Fennel, dried	Burnet
Dill, do.	Thyme
Chervil, do.	Sage
Marjoram, do.	Rosemary
Basil, do.	Anise seed
Mint, do.	Coriander do.
	Caraway do.

APRIL

Brussels-sprouts	Winter Cress
Borecoles	Burnet
Broccolis	Water Cress
Coleworts	Parsley
French Beans, for harricots, from the seed-room	Taragon
Peas for soups, do.	Angelica
Spinach	Mushrooms
Sorrel	Potatoes
Onions, from the stores	Jerusalem Artichokes
Young do. for salads	Yellow Turnip
Welsh Onions	Carrot
American Cress	Parsneps
	Red Beet

Skirret
 Scorzonera
 Salsafy
 Garlic
 Eschalots
 Rocambole
 Lettuce
 Endive

Celery
 Horse-radish
 Thyme
 Mint
 Sage
 Rosemary
 Tansey

MAY.

Early Cabbage
 Cauliflowers
 Broccolis
 Coleworts
 Young Peas, though rarely, at the end
 of the month
 Potatoes
 Jerusalem Artichokes
 Turnips
 Carrots
 Red Beet
 Lettuce
 Endive
 Celery
 Succory
 Taragon
 Thyme
 Sage
 Mint
 Morels, from their native habitats
 Mushrooms, from beds

Young Radishes
 Spinach
 Sorrel
 Onions, from the stores
 Onions, young, for salads
 Leeks
 Welsh Onions
 Chives
 Garlic
 Eschalots
 Asparagus } in perfection
 Sea-kale }
 Salads of all kinds in perfection
 Parsley
 Purslane
 Horse-radish
 Tansey
 Costmary
 Rhubarb, blanched or otherwise
 Angelica
 Anise

JUNE

Cabbage } in perfection
 Cauliflowers }
 Kidney-beans
 Peas
 Garden-beans
 Old Potatoes, from the stores
 New Potatoes
 Asparagus } till the middle of the month
 Sea-kale }
 Lettuce
 Parsley
 Fennel
 Dill
 Marygold
 Rhubarb
 Angelica
 Morels, from their natural habitats
 Turnips

Carrots
 Radishes
 Spinach
 Sorrel
 Chives
 Young Onions
 Rocambole } from the stores
 Garlic }
 Small Salads
 Purslane
 Taragon
 Horse-radish
 Thyme
 Sage
 Mint
 Savory
 Basil
 Mushrooms, from beds in the open air.

JULY.

Cabbage	} in perfection	New Potatoes
Cauliflowers		Turnips
Peas		Carrots
Beans		Radishes
Kidney-beans		Onions, bulbed
Spinach		Onions, young, for Salading
Sorrel		Artichokes
White-beet		Alisanders
Small Salads		Rampion
Lettuce		Parsley
Radishes		Purslane
Indian-cress		Thyme
Marygold		Sage
Borage		Mint
Fennel		Balm, and all other herbs
Angelica Stalks		Radish-Pods } for pickling
Gourds		Cucumbers }
All Pot-herbs and Salads in perfection		Morels, from their native habitats
Mushrooms, from ridges		

AUGUST

Cabbage		Carrots
Cauliflowers		Radishes
Broccolis		Jerusalem Artichokes (seldom used at this season)
Peas		Red Beet
Beans		Onions, bulbed
Kidney-beans		Do. small, for salad
Spinach		Eschalots
White-beet, for <i>chard</i>		Garlic
Sorrel		Rocamboles
Artichoke		Small Salads
Cardoon		Lettuce
Rampion		Endive
Parsley		Radishes
Purslane		Borage
Indian-cress		Fennel
Marygold		Thyme
Caraway	} seeds	Sage
Anise		Mint
Gourds, of all sorts		Balm, and all other herbs, green or dry
Love-apples		Radish Pods } for pickling
Egg-plant		Cucumbers }
Capsicum		Mushrooms, from garden-beds and fields
Truffles, from woods		Champignons, from open pastures.
Potatoes		
Turnips		

SEPTEMBER

Cabbage	Potatoes
Cauliflower	Turnips
Broccolis	Carrots
Peas	Parsneps
Beans	Skirret, and all other roots
Kidney-beans	Spinach
Onions	White Beet, for <i>chard</i>
Eschalots	Sorrel
Garlic	Artichokes
Rocamboles	Cardoons
Leeks	Rampion
Small Salads	Taragon
Endive	Parsley
Lettuce	Horse-radish
Celery	Indian-cress
Fennel	Marygold
Chervil	Thyme
Gourds and Pumpkins	Sage
Love-apple	Mint, and all other herbs
Capsicum	Red Cabbage
Egg-plant	Radish Pods
Mushrooms, from beds and fields	Cucumbers
Truffles, from woods	Champignons, and all the eatable Fungi,
Morels, from their natural habitats	in perfection.

OCTOBER

Cabbages	Beans
Cauliflowers	Kidney-beans, (<i>if favourable weather</i>)
Broccolis	Carrots
Potatoes	Radishes, of all sorts
Turnips	Skirret
Jerusalem Artichokes	Salsafy
Red Beet	Scorzoneria
Spinach	Sorrel
White Beet, for <i>chard</i>	Onions
Leeks	Celery
Garlic	Small Salads
Eschalots	Endive
Rocamboles	Lettuce
Winter-cress	Saccory
Burnet	Parsley
Indian-cress	Horse-radish
Marygold	Fennel
Gourds	Thyme
Pumpkins	Sage
Love-apple	Mint, and all other herbs

Capsicum	Red Cabbage	} for pickling
Egg-plant	Radish Pods	
Mushrooms	Cucumbers	
Peas	Many of the eatable Fungi (<i>if mild weather.</i>)	

NOVEMBER.

Cabbages	Borecoles	
Cauliflowers (now protected)	Potatoes	
Broccolis	Turnips	
Brussels-Sprouts	Carrots	
Winter-radish	Skirret	
Jerusalem Artichokes	Salsafy	
Red Beet	Scorzoneria	
White Beet, for <i>chard</i>	Spinaoli	
Sorrel	Onions	
Rocamboles	Leeks	
Cardoons	Garlic	
Rampion	Eschalots	
Endive	Celery	
Lettuce	Parsley	
Winter-cress	Horse-radish	
Burnet	Fennel	
Thyme	Chervil, dried	
Sage	Caraway	} seeds
Rosemary	Anise	
Savoys	The edible roots, as in last month.	

DECEMBER.

Cabbages	Brussels-Sprouts
Cauliflowers (when protected or pre- served)	Borecole
Broccolis	Potatoes
Savoys	Turnips
Winter-radish	Carrots
Jerusalem Artichokes	Scorzoneria
Red Beet	Salsafy
White Beet, for <i>chard</i> , when protected	Skirrets
Eschalots	Onions
Rocamboles	Leeks
Cardoons	Garlic
Winter-cress	Celery
American do.	Endive
Thyme	Lettuce
Sage	Parsley
Rosemary	Horse-radish.

SYSTEMATIC CATALOGUE

OF

CULINARY SEEDS,

COMPRISING THEIR VARIOUS SPECIES, AND THE PRINCIPAL VARIETIES WHICH ARE IN GENERAL CULTIVATION ; THEIR NATIVE PLACE OF GROWTH, IF INDIGENOUS ; AND IF EXOTIC, THE TIME OF THEIR INTRODUCTION.

ALEXANDERS, or ALISANDERS,—*Smyrnium olusatrum*, (Linnæus)—belongs to the class and order *Pentandria Digynia*, and ranks in the natural order of *Umbelliferæ*. The alisander is a native of Britain, grows naturally near the sea, and is often to be observed naturalized, near old buildings. It was in more general use many years ago, than it is at present, and was much cultivated before the use of celery became so general. It is used as a culinary plant when blanched, and is of a warm aromatic quality. There is only one variety cultivated.

ASPARAGUS,—*Asparagus officinalis*, (Linn.) — belongs to the class and order *Hexandria Monogynia*, and ranks in the natural order of *Asphodelææ*. Asparagus is a native of Britain, and is found on gravelly situations near the sea, as for instance in the vicinity of Bristol, in the isle of Portland, and Seaton Links, near Edinburgh. It is common on the shores of the north of Europe, and many of the *steppes* in the south of Russia and Poland, are covered with it; it is there eaten by the cattle as grass. It is so much altered in appearance and size, by cultivation, that those who are perfectly acquainted with it in their gardens, would not, without a considerable share of botanical knowledge, recognize it in its native state.

This excellent vegetable, which is in general use, not only in Britain, but over all the continent of Europe, and in many parts of America, has been in cultivation for an unknown period.

Those who have never seen the vast loads of this vegetable daily brought during its season, to Covent-Garden Market, will be surprized to hear, that in the parish of Mortlake alone, there are computed to be above eighty acres under this crop; and one gardener of the name of Biggs, has frequently forty acres under asparagus, and another near Deptford has eighty. The natural season of asparagus, round London, lasts from ten to twelve weeks; but forced asparagus is to be had from November until it be produced from the open ground. It brings the price of about one pound per hundred heads, during the months of November, December, January, and February, and in May and June, from 10s. to 2s. 6d. per hundred.

The varieties in general cultivation are the red-topped, or Dutch, which is the strongest of the two, and the green-topped, which is not so large, but is reckoned of a better flavor. The varieties in the seed catalogues, are the Battersea, Deptford, large Grave-end, large Reading, Dutch, Cork, and early Mortlake, but they are only considered as sub-varieties of the two former.

ANGELICA,—*Angelica archangelica*, (Linn.)—belongs to the class and order, *Pentandria Digynia*, and ranks under the natural order of *Umbelliferæ*. It is found in

Britain, but has been probably naturalized; it is also common in Lapland and Iceland. It appears to have been cultivated in England before 1568. This vegetable is also nearly supplanted by the more general use of celery, and like the Alisanders, is now little used in domestic cookery. The leaf-stalks are now only used for candying, and for this purpose, are in perfection in Mâÿ. It is more generally used in medicine than in cookery. The roots were formerly blanched and eaten like celery. The young shoots are in great esteem amongst the Laplanders, who, in order to add to the pungency of the tobacco, which they are in the habit of using, mix with it the roots of *Angelica Archangelice*, but if this species be not at hand, they substitute those of *Angelica sylvestris*. It appears to be a very hardy plant, as according to the *Lachesis Lapponica*, it grows freely within 1400 feet of the line of perpetual snow. In Norway, bread is sometimes made of the roots.

ANISE,—*Pimpinella anisum*, (Linn.)—belongs to the class and order of *Pentandria Trigynia*, and natural order of *Umbelliferae*. It is a native of Egypt, and introduced in 1551. A small portion of it is sufficient for a large family, being only cultivated for a garnish, and sometimes used for seasoning. It is extensively cultivated in Malta and Spain, and the seeds are thence imported into this country for distillation and expression. It is also used in medicine with beneficial effects.

BASIL,—*Ocimum basilicum* and *Ocimum minimum*, (Linn.)—belongs to the class and order *Didynamia Gymnosperma*, and natural order of *Labiatae*. The former is a native of the East Indies, and was introduced in 1548; the leaves are used occasionally, both in salads and soups. The latter is also a native of the East Indies, and was introduced in 1573. The seeds of both sorts are seldom ripened in England, and are by the seeds-men, procured from Italy.

BEAN,—*Vicia faba*, (Linn.)—belongs to the class and order *Diadelphia Decandria*, and natural order *Leguminosae*. The bean is a native of Egypt, and other parts of the east. One variety, the Mazagan, is indigenous to Mazagan, a Portuguese settlement on the African coast. The bean has been known in this country from time immemorial, and it is supposed to have been introduced by the Romans. There are many varieties cultivated, some of them differing so little in their characteristics, as to be scarcely distinguished. The following are the best:—Early small mazagan, early long-pod, sword long-pod, Turkey long-pod, early small Lisbon, large long-pod, broad Spanish, Windsor broad, large Kentish Windsor, Taylor's Windsor, Sandwich, Tokar, white blossomed, green nonpareil, Mumford, dwarf-cluster, fan or bog, and the new red blossomed. Of these, the three former are the earliest, the others, excepting the dwarf-cluster, fan or bog, are for principal crops. The dwarf-cluster, fan or bog, is for cultivation in borders, and in small gardens, when there is a paucity of room, as it occupies little space. *Delaunay in Le bon Jardinier*, describes a new sort cultivated about Paris, called the green bean of China. We cannot, however, give an opinion of its merits, never having seen it. It is, however, described as a good bean, late, but productive, and the seeds are said to remain green, even after being ripe and dried.

BEANS, *Kidney* or *French*,—*Phaseolus vulgaris*, (Linn.)—belonging to the class and order *Diadelphia Decandria*, and natural order of *Leguminosae*. It is a native of India, and introduced in 1579 or earlier, and cultivated in our gardens as a tender and much-admired esculent; the parts used, are the pods before they have arrived at maturity. In France, and other parts of the continent, as well as in America, they cultivate them in the fields, and it has been suggested, that the same practice would be beneficial in this country, as they will grow in any tolerably good soil, and become particularly useful in times of scarcity, either in their green state, or dried and ground into flour. On the continent, the ripe seeds are used in cookery, forming what are called harricots of different kinds, and are also put into some sorts of soups.

At the end of the season the crop is gathered, haulm and all, and after being properly dried, they are stacked, and the seeds threshed out when wanted.

The sorts cultivated are the early yellow dwarf, early red speckled, early black or negro, early white, Battersea white, Canterbury white, black speckled, brown speckled, dun coloured, striped, tawny, large white, dwarf, China. The first four are generally used for forcing, and the Battersea and Canterbury are generally preferred by the London market-gardeners for general crops for sale, as being prolific bearers.

BEANS, Kidney, or Scarlet and white runners,—*Phaseolus multiflorus*, (Linn.)—is a native of South America, and introduced in 1633. It is used for all the purposes of the last, but differing from it so much in its botanical character, as to constitute a distinct species. It differs also in its culture on account of its being a climbing plant, and requiring to be supported by means of stakes, trellices, or other means. It will grow on the ground, as the other kinds, but arrives at greater perfection when supported by sticks or strings. In cottages and small gardens, they are successfully cultivated, by planting them in rows to hide any disagreeable object, or they are trained over arbors, or up the front and ends of the cottages. If supplied plentifully with water, and the pods picked off as they are fit for use, they will continue a useful ornament for many weeks. The frost being the only thing to injure them under these circumstances.

The varieties of the runners are :—The scarlet, large white, white Dutch, princess runner, and variable runner; of these the first is the best, and is most generally cultivated; next to it is the large white. The white Dutch does not last so long in bearing, and the last is not so much esteemed, neither is it so extensively cultivated. The princess runner has lately been brought into notice, it is an excellent bearer, and the pods are used when full grown. All the sorts of French beans, are much improved by being transplanted, and can be forwarded much earlier, if reared in flat boxes, or in pans, and when about three inches in height, transplanted where they are intended to remain. None of the varieties are fit for forcing, as they all require too much room.

BEET, RED,—*Beta vulgaris*, (Linn.)—belonging to the class and order *Pentandria Dygina*, and natural order *Chenopodeæ*. Is a native of the sea-coast of the south of Europe, and cultivated here by Tradescant the younger, in 1656, consequently it must have been introduced at an earlier period. The roots are used in salads, boiled and sliced, and also as a garnish, but particularly as a pickle. They are most esteemed, when their roots boil of a beautifully red colour. The roots, when dried and ground, are sometimes mixed and used with coffee. The seeds of good red-beet are difficult to be procured; therefore, when once a gardener is in possession of a good sort, he ought to endeavour to save his own seed. The following are the sorts grown in the garden of the Horticultural Society of London :—The large rooted, long rooted, dwarf, turnip rooted, small red, green topped, and Castlenaudari; of these, the dwarf is the best, and the turnip rooted, the earliest. The Castlenaudari is much esteemed on the continent, and is said to have the flavour of a nut.

BEET, WHITE,—*Beta Cicla*, (Linn.)—belonging to the same genus as the preceding, but differing from it in botanical characters, and in garden uses. This species being cultivated solely for its leaves, which are used as spinach, or put into soups, and the mid-ribs and stalks are stewed and eaten as asparagus, under the name of chard. It is a native of the sea-coasts of Spain and Portugal, and introduced in 1570, and cultivated by Gerrard, and Parkinson, who was botanical gardener to Charles the first. There are three varieties cultivated; the first is the common white, the second, the great white or Swiss chard, and the third, though seldom grown in our gardens,

is an extremely useful agricultural root, called mangel würcel, or the great German beet.

BET, SEA,—*Beta maritima*, (Linn.)—belonging to the same genus with the two last, but so differing in its botanical characters, as to constitute a distinct species. It is a native of our sea-coasts in many places, in the Isle of Wight, Coast of Sussex, Western Coast, &c., is seldom cultivated in our gardens, but there is little doubt that it would be much improved by cultivation, and be a valuable accession to our spinaceous vegetables.

BROCCOLI,—*Brassica oleracea*, a sub-variety of the variety *botrytis* (Linn. and Decandolle)—belonging to the class and order *Tetradynamia Siliquosa*, and natural order *Crucifera*. However singular it may appear, professor Decandolle and others have proved, that all the varieties of broccoli have their origin in the *Brassica oleracea*, or the common wild cabbage. Miller mentions several kinds of broccoli as being cultivated in his time; he says, “the *Roman*, *Neapolitan*, and *black broccoli*, are in use, but of those, the *Roman* is the best.” Since his time, they have wonderfully increased, but this is less surprising, for of all the brassica families, they are the most inclined to sport into varieties. They are supposed by some to have sported from the cauliflower, which is said to have been introduced into this country, from the Isle of Cyprus, about the middle of the sixteenth century. Miller seems to prefer them to cauliflower, as being more tender, and by many they are preferred even at the present time. The best collection of broccolis we have met with, is that of Messrs. Ronalds’, of Brentford, and given as follows in the Hort. Trans.—Purple cape, or autumnal; green cape, or autumnal; Grange’s early cauliflower broccoli, green close-headed winter broccoli, early purple, early white, dwarf brown, close-headed broccoli, tall large-headed purple broccoli, cream coloured, or Portsmouth broccoli; sulphur coloured broccoli, spring white, or cauliflower broccoli; late dwarf close-headed purple broccoli, latest green, or Siberian, or Danish broccoli. To this list may be added, the sprouting broccoli, and Belvidere, or improved white, two sorts which may be considered as distinct from any of the above-mentioned sorts, and are in our estimation excellent. The former of these, is a hardy spring sort, and the latter, a handsomely formed and equally good one, but probably not equally hardy.

Of Messrs. Ronalds’ lists, the two former are nearly allied to each other, differing only in colour, and the head of the second being rather larger, as well as the whole plant stouter than the first. The third is a well-known sort, and will amply repay the expense of cultivating; the fourth is said to be rather new, and is supposed to be a seedling from the second; it does not attain to a great size. The early purple is a good sort, but is apt to branch, if planted in too rich ground. This sort grows to the height of two or three feet, and is a strong growing plant. The early white is also a fine broccoli of a beautiful colour, and grows nearly three feet high. The cream-coloured, or Portsmouth, is an excellent sort, and merits general cultivation, we would include it as among the best for general use. In May, 1819, a head of this sort, grown in the garden of the late Sir Joseph Banks, was sent to the Hort. Soc., which measured above two feet in circumference, and quite firm and close. The sulphur-coloured is a valuable sort, hardy, compact, and rather conical in the head. The spring white is a valuable sort, the leaves of which grow in such a cucullated manner as almost to hide the flower, and serve as a shield to protect it from the frost common in the spring months. The two latter sorts are very hardy, particularly the last, which no winter can destroy. This sort for a late crop should be planted to a large extent, as it comes into use at a season when vegetables are most in demand, and it may be planted closer than any other, so that a large quantity may be produced on a small piece of ground.

Italian cabbage, the name by which broccolis were formerly known, must have been cultivated in Britain at an earlier period. It is probable, that the Romans introduced it from Italy.

Cape broccoli is said to have been introduced from the Cape of Good Hope, by the Hon. Marmaduke Dawnay, and first cultivated in Surrey.

BORECOLE,—*Brassica oleracea*, var. *Sabellica*.—Is another family, which claims a common origin with the broccoli, cauliflower, &c., in the *Brassica oleracea*, or common cabbage. There are several valuable sub-varieties, more or less esteemed by the individuals, where they are principally grown. The sorts cultivated are as follow: the green borecole, Scotch kale, or Siberian borecole. This is a very hardy sort of kale, and although not universally cultivated in England, is still worthy of our attention. To cottagers and farmers a more useful vegetable cannot be introduced in their little gardens, for no frost hurts it; and if planted on ground which has been occupied with the early crops of peas or potatoes, it will have attained a considerable size before the rigour of the winter sets in. It is universally cultivated by the Highlanders, and is found to stand the most severe winter. It may be considered the national vegetable of Scotland, and is the regular garnish of the boiled beef at weddings, curling dinners, &c. It is surprising to see the numerous varieties that this sort sports into in one small cottage-garden; from twenty to thirty distinct varieties may be easily distinguished, by the different shades of colours and the form of the leaves. The purple or brown kale is nearly allied to the last, and is equally hardy. The German kale, German greens, or curlies, is a beautiful variety, and very hardy: of this there are two sub-varieties, one of which grows close to the ground, the other grows much taller, and furnishes a good supply of sprouts in spring. This is the sort most in cultivation in the gardens in Scotland.

The variegated borecole, and the thousand-headed cabbage, are merely curious varieties, but inferior to the others, in their general merits.

The Egyptian kale, rabi kale, ragged Jack, and the Jerusalem kale, are dwarf-growing sorts; they resist black frosts, and come in for a late supply. The Buda kale, Russian kale, Prussian kale, and Manchester kale, are supposed to differ very little from the former. A writer, however, in the Transactions of the Horticultural Society, has, by blanching Buda kale, very much improved it; and the process is performed nearly in the same manner as sea-kale is blanched, by inverting a flower-pot over it. It may be rendered more delicate by blanching, as well as any other kale which is treated in the same manner. As a substitute for sea-kale, it may be of importance; for, by a little management, it might be had at a season when sea-kale cannot be procured.

The palm borecole is not likely to be much cultivated; it is a rambling growing sort, and is cultivated in the orchards of the islands of Jersey and Guernsey, by planting it among the fruit-trees; and as it increases in growth, it reclines among the lower branches of the trees, and may in that case escape the frosts. We have grown it to the height of twelve feet by the side of a wall.

The turnip-cabbage, or turnip-rooted borecole, is a curious variety. In a recent work published, two sub-varieties of this sort are mentioned, one of which has the turnip or bulbous part, which is the part used, growing above the surface, and in the other sort, it grows under ground. The roots are cut in slices for soups, and by some are used like common turnips; but unless they be used when they are young, they become rank and unpalatable. They are very hardy, and stand a severe frost, and require good rich ground to bring them to any profitable size. The Portugal or large-ribbed borecole, is not much used, nor does it possess any great merit. The Woburn kale differs from all the foregoing sorts, inasmuch as they are propagated

by seeds, whereas this variety is propagated by cuttings. It has been grown at the Duke of Bedford's, at Woburn Abbey, from which place it takes its name.

BRUSSELS-SPROUTS,—*Brassica oleracea*, a sub-variety of the variety *Sabauda*.—Of this excellent vegetable we have only this one sort, which derives its name from the city of Brussels, where it is both much esteemed and cultivated. It appears, by a communication to the Horticultural Society by Van Mons, that it is mentioned, in the market-regulations of that place, so early as the year 1213. The top is different in flavour from the side-sprouts, and should, in cultivation, be taken off to encourage the growth of the sprouts. The plants from the circumstance of their heads being cut off, and their leaves falling off, need not be planted at more than eighteen inches each way, so that upon a small piece of ground a large produce is obtained.

It is difficult to procure the seeds genuine, therefore it is either better to have them sent direct from Brussels by some confidential person, or after having once obtained a good sort, to save the seeds for future use. Van Mons says, that it is usual to save the seeds indiscriminately from plants, which have not been topped, but he intends in future to save only from those plants which have been topped. The principal consideration, however, in the saving of this seed, as well as that of all other plants of the brassica tribe, is to place them where there is no chance of their being impregnated by the farina of other plants of the brassica family. This is, however, very difficult to be accomplished in the vicinity of an apiary, as the bees are apt to carry the farina of the brassica tribes to their different varieties, and thereby give a spurious character to the seed collected from them.

BORAGE,—*Borago officinalis*, (Linn.)—belongs to the class and order *Pentandria Monogynia*, and to the natural order *Boraginææ*. It is a native of Britain, and is not unfrequently met with in waste places. It is seldom used in modern cookery, although formerly it was in high repute. The juice affords nitre, and the withered stems have been observed to burn like match-paper. It is used in England as one of the components of a particular beverage, known by the appellation of a cool tankard.

BURNET,—*Poterium Sanguis orba*. (Linn.)—belongs to the class and order *Monœcia Polyandria*, and ranks in the natural order of *Rosacææ*. Is a native of Britain, growing on dry chalky pastures. The leaves are sometimes used in salads, and occasionally in soups. It was formerly in much repute, but at present it is almost quite disregarded. It was cultivated as a food for cattle for some years, on the authority and recommendation of Bartholomew Rocque, a farmer at Walham Green, near London.

BLESSED THISTLE,—*Centaurea benedicta*, (Linn.)—belonging to the class and order *Syngenesi Frustranea*, and natural order of *Cynarocephalææ*. Is a native of Spain and the Levant, and introduced in 1548. It has never been much in use as a culinary vegetable, but as a medicinal plant it was held in high repute. It is now neglected both in medicine and rural economy.

BLADDER-CAMPION,—*Silene inflata*. (*Hortus Kewensis*), *Cucubalus behen*. (Linn.)—belonging to the class and order *Decandria Trigynia* and natural order *Caryophyllææ*. Is a native of Britain, and often found on the sea-shore. This plant was also much used formerly, but of late years has been neglected. The young tops were used, when boiled, nearly in the same manner as asparagus.

CABBAGE, common or white, *Brassica oleracea*, var. of *capitata*, (Linn. and *Decandolle*),—belongs to the class and order *Tetradynamia Siliquosa* and natural order *Cruciferaææ*. The *Brassica oleracea*, of which this is a cultivated variety, is a native of some of our sea-shores. Cabbages seem to have been one of the earliest vegetables which attracted the attention of mankind. They were well known and

esteemed by the Romans, who probably introduced the cultivation of them into this country, bringing with them from Italy some of the sorts then cultivated by them.

The varieties of *Brassica oleracea* var. *capitata*, or white cabbage, cultivated in our gardens, are, the small early dwarf, early dwarf York, large early ditto, early dwarf sugar-loaf, large sugar-loaf, East Ham, West Ham, early Battersea, late ditto, early Imperial, Pentonville, Plaw's early, Deptford, Emperor, Antwerp, Russian, early London, large hollow sugar-loaf, large oblong hollow, large-round winter white, drum-head, round Scotch or white Strasburg, Baimbridge's flat Dutch. Of these, the first five are the best for early crops, and also for the latter ones. The last is an excellent sort for early summer use. The next five are good for principal summer crops. The Pentonville is a curious cabbage, wrinkled like the savoy, and very tender and white; it never closes nor becomes hard. It is decidedly the best for summer use; it continues delicate and well-flavoured when all others are rank and ill-tasted. Plaw's early, is also a good sort for either early or late crops; the rest may be cultivated for summer and autumn uses, and have each their respective merits. The drum-head and round Scotch are generally cultivated in fields for cattle. From the last of these two is prepared the *sauer kraut* of the Germans.

CABBAGE, RED,—*Brassica oleracea*, var. *rubra*, (Linn.)—belongs to the same natural and artificial class and order with the last-mentioned, and is another variety sported from the original *Brassica oleracea*. It is chiefly used for pickling and garnishing. The principal varieties cultivated are, the large red or red Dutch, dwarf red, and the Aberdeen red. The first is usually cultivated in market-gardens. The second is the best, and is usually grown in the gardens of gentlemen, and is most esteemed for its beautiful colour. The third is much cultivated for culinary purposes by the natives of Aberdeenshire, and some parts of the North of Scotland, and is an ingredient in the national dish, "*The kale brose*."

CAULIFLOWER, — *Brassica oleracea*, var. *botrytis*. (Linn. and Decandolle,) is another variety originating in the *Brassica oleracea*, and a much-esteemed culinary vegetable, being, according to Dr. Johnson, the best flower that grows in the garden. Cauliflower was first introduced to this country from the isle of Cyprus, about the middle of the sixteenth century. The culture of it was little attended to till the beginning of the seventeenth; and previous to the French Revolution, cauliflower-seed was regularly sent to Holland, and even to France; at the present day, English seed is preferred to that of the growth of either of those countries. The same remark which we made regarding the quantity of asparagus, cultivated round the metropolis for the supply of Covent-garden Market, &c., will also apply to the cultivators of the cauliflower, who have often many acres under this crop.

The sub-varieties in cultivation are the early, the late, and the red cauliflower; of these three, we have been unable to discover much difference in point of quality. Their distinctions are too trifling to merit the attention of the practical horticulturist. Like the rest of the brassica tribe, they are apt to sport into degenerate varieties from seed. "An action for damages was brought in Westminster Hall above a hundred years ago, against an innocent, but unfortunate gardener, for selling cauliflower-seed which only produced long-leaved cabbages. This circumstance has been particularly noticed by Linnæus, in his celebrated treatise on the sexes of plants, the '*Sponsalia Plantarum*.'"

CAPSICUM, Linn.—A genus belonging to the class and order *Pentandria monogynia*, and natural order *Solanaceæ*. There are three species in cultivation, and of these, there are many varieties.

Of these species, the *Capsicum annum*, or Guinea-pepper, is, with its varieties, most generally cultivated. It is a native of India. It was introduced here in 1549,

and cultivated by Gerrard. The unripe, or green pods, are used for pickling, and in their ripe state form a spice of the hottest quality, known by the name of Cayenne pepper. Of this species, there are varieties differing extremely in their fruit, as in the long-podded annual kind, with oblong pendulous or hanging scarlet-pods; with oblong pendulous yellow pods; with upright oblong scarlet pods; with short upright pods; with divided pods; and with long very taper pods; all of which often rise from the same seed of the common long-podded, red or yellow sort, rarely differing from each other in color, but often in the size, and position of their growth. The other species vary in the same manner.

The next species is the *Capsicum cerasiforme* (*Hortus Kewensis*). Is a native of the West Indies, introduced in 1759, and is used for the same purposes as the last. The varieties of this species differ in size, color, and shape. They are generally of a globular or cherry-shape, from which they derive their name; but are sometimes heart-shaped, bell-shaped, or angular, and are both red and yellow.

The third species is *Capsicum grossum*, or bell-pepper. Is a native of India, and was introduced in 1759. Is a biennial; the fruit is used for the same purposes as the foregoing, and by some it is preferred for pickling, the skin being thick, pulpy, and tender.

CARDOON or CHARDOON,—*Cynaria Cardunculus*, (Linn.)—belonging to the class and order *Syngenesia Polygamia Æqualis*, and natural order *Cynarocephalæ*. Is a native of Candia, and introduced into this country in 1658. It nearly approaches to the artichoke in appearance, and belongs to the same family. It is rather a singular circumstance, that it should be known in all the European languages by the same name. This plant is used in a variety of ways, particularly in French cookery. There is only one variety cultivated in our gardens, and that one not very generally. Mr. Neil says, that the native prickly sort is cultivated on the continent, under the name of cardoon of Tours, and is accounted preferable to the common sort which is cultivated in our gardens. It is truly singular, that that sort, whatever may be its qualities, has not been introduced into England. Ours is sold in the seed-shops for the Spanish cardoon.

CARROT,—*Daucus carota*, (Linn.)—belongs to the class and order *Pentandria Digynia*, and natural order *Umbelliferae*. Is a native of Britain, found in chalky pastures and in waste places in almost every part of the kingdom. The effects of cultivation have entirely altered the appearance of its root, which is the part used. In its natural state, it is small, hard, and dry, of a white color, and strong flavor. In its cultivated state, the root becomes large, succulent, and of a red or yellowish color. We have no certain data to denote the precise time that carrots were first cultivated in this country; but in the time of Henry the Eighth, Hume, the historian, says, that neither ‘salads, carrots, turnips, nor other edible roots were produced in England.’ Previously to that time, these vegetables were imported from Holland and Flanders. That they did not originate in this country, like the sea-kale, is pretty evident from the above quotation. The leaves of carrots were held in esteem by the ladies, even of the gay court of Charles the First, for Parkinson, the botanic gardener of that monarch, informs us, that they wore them instead of feathers. The carrot is not an article only of garden produce, but is extensively cultivated in fields for cattle. The varieties cultivated are the following:—early red horn, common early horn, long horn, long white, yellow, long yellow, long orange, long red, long purple, and the Alteringham carrot. The two first are generally sown for the first crops; but the Alteringham is equally early, and in our opinion a much better carrot, indeed, it is the best sort in the country. The long white yellow is an excellent and rather curious variety, it eats sweet, and looks beautiful when dressed: it is good for autumn use, but does not keep well in store. Of its merits, in regard to economy,

we have not yet had sufficient time to form a decision. The Alteringham is originally from Cheshire, and for general culture is the best. The long red is a large sort cultivated chiefly for cattle, and by farmers, for colouring butter. The orange, next to the Alteringham, is best for a general crop, and affords a variety in colour.

The purple carrot, though mentioned by some of the early writers on horticulture, seems to have been long disused in this country. It is well known in France, as the *Carrotte violette*; the root is thick at the top, and tapers suddenly. The outer part of the flesh, for about a quarter of an inch in thickness, is a deep purple, the inner part a light yellow, and the heart a dark yellow, but it is sometimes light also, divided from the flesh by a dark yellow ring. It is only cultivated on account of its singular appearance. The flavor is not so good as any of the others in cultivation. The French, however, esteem it highly, but consider it as apt to run to seed the same year in which it is sown.

CARAWAY,—*Carum carui*, (Linn.)—belongs to the class and order *Pentandria Trigynia*, and natural order *Umbelliferae*. Is a native of Britain, and has been long cultivated. The seeds are used in confectionery and medicine. In the north, they often put them into cheese in the same manner as the Dutch; the Danes and Russians sprinkle the tops of their loaves with them. In Parkinson's time, the roots were eaten as parsneps, and by him preferred to that vegetable. They are not now used. The seed, which is much used by distillers, and in medicine, is grown chiefly in Essex.

CELERY,—*Apium graveolens*, (Linn.)—belongs to the class and order *Pentandria Digynia*, and natural order *Umbelliferae*. Is a native of Britain. It grows naturally in ditches, and generally near the sea. This vegetable is much improved by cultivation. The taste, in its natural state, is rank, and the whole plant of a coarse habit; indeed, in that state it is suspected to contain some of the narcotic properties of its near associates, *Cenanthe*, *Phellandrium*, &c. It is unsafe to gather it in its natural state, as many fatal instances are on record of people having been poisoned by eating plants of the two genera above-mentioned, by mistaking them for celery. The stalks, when blanched, are used raw as a salad, and in their unblanched state, are used in domestic cookery. It is in general use over almost all Europe. The turnip-rooted sort, or celeriac, is in general use among the Germans.

The sorts in cultivation in our gardens are, the upright Italian, large hollow upright, solid upright, large red-stalked upright, and the turnip-rooted, or celeriac. The first three sorts are preferable for general crops; the fourth is fit for stewing, and is hardy enough to stand a severe winter. The celeriac is cultivated for its roots, which may be preserved all winter in sand, or by any other ordinary means. It is much cultivated about Hamburg, and is thence imported to the London market.

CHERVIL,—*Scandix Cerefolium*, (Linn.)—belongs to the class and order *Pentandria Digynia*, and natural order *Umbelliferae*. Is a native of Europe, but often found naturalized in many parts of England. Is used as a salad, and for garnishing; for the latter use there is a sort more curled in the leaves, which is to be preferred, and which is grown in all the Paris gardens. It is sold in our seed-shops under the name of curled chervil.

CLARY,—*Salvia Sclarea*, (Linn.)—belongs to the class and order *Diandria Monogynia*, and natural order *Labiatae*. Is a native of Italy, and introduced here in 1562. It is seldom used.

CORIANDER,—*Coriandrum sativum*, (Linn.)—belongs to the class and order *Pentandria Digynia*, and natural order *Umbelliferae*. Is a native of the East, but introduced at an early period into England, and is now naturalized in many parts of

it. It is sometimes used as a salad, and as an ingredient of soups. In Essex, and some other places, it is extensively cultivated for the seed, which is used by confectioners, druggists, and distillers.

CORN-SALAD, or LAMB-LETTUCE,—*Valeriana Locusta*, (Linn.)—belongs to the class and order *Triandria Monogynia*, and natural order *Dipsacææ*. Is a native of Britain, and was cultivated as a salad in the days of Gerrard, who says, that foreigners, while in England, using this salad, were the cause of its being cultivated in our gardens. It has long been a favorite salad in France, but is now little used here.

CRESS, AMERICAN,—*Erysimum præcox*. (Smith.)—belongs to the class and order *Tetradynamia Siliquosa*, and natural order *Cruciferææ*. Is a native of Britain, growing by the sides of ditches, and long supposed to be a variety of the *Erysimum Barbaria*. It is a biennial, forming an excellent and useful addition to our winter and spring salads, being extremely hardy, and is fit for use during the whole of the winter, if grown in any sheltered spot. It is sold in the seed-shops under the names of American cress, black cress, and French cress.

CRESS, WINTER,—*Erysimum Barbaria*, (Linn. and Smith,) *Barbaria Vulgaris* (*Hort. Kew.*)—belongs to the same class and order with the last species. This is found in situations similar, and often with the latter, by which reason they have been, till lately, confounded together. It is also a useful and hardy salad.

CRESS, GARDEN,—*Lepidium sativum*, (Linn.)—belongs to the class and order *Tetradynamia siliquosa*, and natural order *Cruciferææ*. Its native country is unknown, but it has been cultivated in this country since 1548. It is the principal of all the small salads, and is in very general cultivation. The varieties in culture are, the common plain-leaved cress; this is most extensively cultivated, but not by any means so fine as the Normandy or curled cress, which is not only a better salad and garnish, but much hardier and not so apt to run up into seed. If sown at the bottom of a south wall, it will stand all the winter, and come in at the spring with the American and winter cresses already noticed. It is not so good, however, for forcing as the common cress, being more likely to damp, in consequence of its larger and more succulent growth, unless it be sown very thin. The other sort of cress cultivated is, the broad-leaved; it is not much grown for a salad, but generally for rearing turkies, &c.

CRESS, INDIAN, or NASTURTIUM,—*Tropæolum magus*, (Linn.)—belongs to the class and order *Octandria monogynia*, and natural order *Geraniacææ*. Is a native of Peru, and cultivated here since 1686. The *Tropæolum minus* was introduced from Peru nearly a century before this sort, but, owing to its small size, is not cultivated for culinary purposes. The *Tropæolum magus* is here treated as an annual, but in its own country lasts for several years. The flowers are used for garnishing, and sometimes, with the young leaves, as a salad. The berries are gathered green, and pickled, and are in that form a good substitute for capers.

DANDELION,—*Leontodon Taraxacum*, (Linn.)—belongs to the class and order *Syngenesia Æqualis*, and to the natural order *Cichoracææ*. Is a native of Britain, and a well-known weed. When blanched, however, it makes an excellent addition to our spring salads; and the roots are considered as good a substitute for coffee as chiccory. It may be stored in cellars, or barrels, like chiccory, for producing winter salads.

DILL,—*Anethum graveolens*, (Linn.)—belongs to the class and order *Pentandria Trigynia*, and natural order *Umbelliferææ*. Is a native of Spain, and introduced in 1570. It is used in soups and sauces, and other culinary preparations. It is not generally cultivated.

EGG-PLANT,—*Solanum Melongena*, (Linn.)—belongs to the class and order *Pentandria Monogynia*, and natural order of *Solanacææ*. Is a native of Africa, and in

roduced in 1597. It is only cultivated in this country as an ornamental annual. In France and Italy, however, it is much used in cookery, and is nearly as much admired as the love-apple.

ENDIVE,—*Cichorium Endivia*, (Linn.)—belongs to the class and order *Syngenesia Æqualis*, and natural order *Cichoraceæ*. Is a native of China and Japan, and introduced in 1548. Is used as a salad, and for stewing. It is in much repute, both in Britain and on the continent. The varieties most generally cultivated are, the green curled-leaved, white curled-leaved, and broad-leaved Batavian. The former is most generally cultivated for principal crops. The second sort is a more delicate plant, and apt to damp off in wet weather. The third is not calculated to stand much frost, but for early autumnal use is much admired.

FENNEL,—*Anethum Feniculum*, (Linn.)—belongs to the class and order *Pentandria Tryginia*, and natural order *Umbelliferae*. Its native place is not exactly known, but it is now naturalized in Britain, and particularly in England. It is sometimes met with in chalky soils in Hampshire, Kent, and Surrey. It is one of the oldest inmates of the gardens, and is used in salads and for garnishes, and, when boiled, enters into many kinds of fish-sauces. The varieties cultivated are, the common or sweet, the dark green-leaved, and the dwarf. The latter sort has long been noticed, but not yet generally cultivated. Mr. Neil observes, that in consequence of "its being more tender than the common fennel, and often perishing in winter, horticultural writers have described it as an annual, under the name of *Anethum Segetum*, French or Azorian *Finocchio*, or annual dill, and advise the culture of it thus: 'To be planted from June till November, and transplanted into trenches two feet asunder, and blanched. The thick fleshy stem to be eaten sliced in salads or soups.'

GOURD and POMPION or PUMPKIN,—*Cucurbita*, (Linn.)—belongs to the class and order *Monœcia Syngenesia*, and natural order of *Cucurbitaceæ*. Natives of India and the East. There are several in cultivation, the principal of which are:

The WATER-MELON,—*Cucurbita citrullus*,—introduced in 1597 from the south of Europe. This is the melon of the ancients, and is at the present time much used in the south of Italy.

The SQUASH,—*Cucurbita Melopepo*. Is a native of the Levant, and was also introduced in 1597. In North America it is cultivated as an article of food.

The POMPION or PUMPKIN,—*Cucurbita Pepo*. Is also a native of the Levant, and introduced in 1570. This is the melon of the early English gardeners; the true melon, *Cucumis Melo*, being then called musk-melon. It is generally cultivated as an ornament of the garden, but by some of the peasantry for pumpkin-pies, &c.

The WARTED-GOURD,—*Cucurbita verrucosa*,—a native of the Levant; *Cucurbita auruntia*, the orange-gourd, a native of India; and the bottle-gourd, *Cucurbita lagenaria*, also a native of India, are only cultivated for curiosity.

The VEGETABLE MARROW,—*Cucurbita succado*,—has been introduced from Persia within these few years. It is cultivated in some families, and used for culinary purposes in every stage of its growth.

LEEK,—*Allium Porrum*, (Linn.)—belongs to the class and order *Hexandria Monogynia*, and natural order *Asphodeleæ*. Is a native of Switzerland, and introduced in 1562; but it is also a native of Egypt, and other parts of the east, and known to those countries before the departure of the Israelites. It is probable, however, that it was known to the natives of this country before the time recorded of its introduction. It is the national vegetable of the ancient Britons. Worlidge, speaking of Wales, says, "I have seen the greater part of a garden there stored with leeks, and a part of the remainder with onions and garlic." The sorts generally cultivated are, the Flanders, or narrow-leaved leek, the Scotch flag, or Musselburg-leek, and the London, broad-leaved or tall leek. The two latter are the best.

LETTUCE,—*Lactuca sativa*, (Linn.)—belongs to the class and order *Syngenesia Æqualis*, and natural order *Cichoraceæ*. It is not exactly known to what country this excellent vegetable owes its origin, but from the names of many of the varieties, they appear to have been brought from some of the Greek islands, and the coast of the Levant. It was cultivated or introduced in 1562. Some authors consider it only a variety of one of the native species. It is the best, and the most universally cultivated salad that we have. “It contains, like all the other species of this genus, a quantity of opium juice, from which, of late years, a medicine has been prepared by Dr. Duncan, senior, of Edinburgh, under the title of *Lactucarium*, and which can be administered with effect when opium is inadmissible.”

The varieties are numerous, of which the following are in general culture:—green cos, white cos, silver cos, spotted cos, Egyptian early cos, black-seeded green cos, white-seeded green cos, brown cos or Batli, red cos, Florence cos, Paris cos, lap, brown Silesia, green Silesia, white Silesia, common white cabbage, large white cabbage, brown Dutch cabbage, imperial cabbage, grand admiral cabbage, tennis-ball cabbage, hardy green cabbage or capuchin, Malta cabbage, large Roman, Prussian, Mogul, Hammersmith, New Cape cos; of these, it may be admitted, that the New Cape cos is the best for general crops, as it grows very large, and is tender and crisp. The brown Dutch for being hardy, the lap to be drawn and used young in small salads; the spotted cos is curious. The hardy green, tennis-ball, and brown Dutch, are the most backward in starting to seed, therefore are highly useful for summer crops. To the brown Dutch, as being a hardy sort, we may add the hardy green, the common white, and the tennis-ball, any of which will stand the winter in ordinary cases. The cos lettuces, have upright, oval, or oblong heads; and the cabbage lettuces have round leaves, and squat, flat, full heads, but are white, firm, and close, when full grown.

LOVE APPLE, or TOMATO,—*Solanum Lycopersicum*, (Linn.)—belongs to the class and order *Pentandria Monogynia*, and to the natural order *Solanacæ*. Is a native of South America, and introduced in 1596. Gerrard and Parkinson, the former writing in 1597, and the latter in 1656, describe it as a plant kept only for ornament and curiosity. They were, however, aware, that the fruit was used in the warmer countries of Europe for culinary purposes. Dodoens, in 1583, describes it as cultivated in the continental gardens, and says, that the fruit was eaten, dressed with pepper, salt, and oil. A white variety is mentioned by Besler, who wrote in 1618. This sort is also noticed by Tournefort, but is now lost. The fruit, when ripe, is used in soups and sauces, and the juice is preserved for winter, like catsup; it is also used in confectionery, as a preserve, and when green as a pickle. The French and Italians are particularly attached to this fruit, and scarcely a dinner is served in Rome or Naples, without this fruit being introduced in some shape or other. To supply this demand, whole fields, in the vicinity of those cities, are annually covered with Tomatoes. There are two varieties cultivated here, if colour be sufficient to mark them as such; the red and yellow, each of which has its sub-varieties, such as the large, small, cherry, and pear-shaped reds, and the large, the small, or cherry-shaped yellow. Of these, the large red, and large yellow are the best; the preference, however, may be given to the former.

MARJORAM,—*Origanum*, (Linn.)—belongs to the class and order *Didynamia Gymnospermia*, and natural order *Labiata*. There are different species cultivated, which are as follow:—

SWEET MARJORAM,—*Origanum Marjorana*. Is a native of Portugal, and introduced in 1573.

WINTER SWEET MARJORAM,—*Origanum Heracleoticum*. A native of Greece, and was introduced in 1640.

POT MARJORAM, *Origanum Onites*. A native of Sicily, introduced in 1759, and
 COMMON MARJORAM, *Origanum Vulgare*. A native of our British woods on
 chalky soils. All the species are aromatics, and are used both in their green state,
 and when dry, for seasoning soups, broths, stuffings, &c.

MARIGOLD,—*Calendula officinalis*, (Linn.)—belongs to the class and order *Synge-
 nesia necessaria*, and natural order of *Corymbiferae*. Is a native of France and
 Spain, and cultivated in this country since 1573. It is one of the oldest and best
 known inmates of our gardens. "Its flowers," Gerrard observes, "having been
 formerly in much repute, as comforters of the heart." It is now rarely employed
 for culinary purposes. In some of the midland counties, it is used in broths, and in
 others for colouring butter.

MUSTARD,—*Sinapis*, (Linn.)—belongs to the class and order *Tetradynamia sili-
 quosa*, and to the natural order of *Cruciferae*. There are two species cultivated.

BLACK MUSTARD,—*Sinapis Nigra*. Is a native of Britain, and is found in fields
 and cultivated places. This species is seldom cultivated in gardens, but is exten-
 sively grown in fields, for grinding and medicinal purposes. When cultivated in
 gardens, its young tops are used along with other small salads, and when full grown,
 the leaves are used as greens.

WHITE MUSTARD,—*Sinapis Alba*. Found in the same places as the last, and is
 much used as a small salad. When the plant is young, it is agreeable, but when
 in its rough leaves, is harsh and unpleasant.

ORACHE, or MOUNTAIN SPINACH,—*Atriplex hortensis*, (Linn.)—belongs to the
 class and order *Polygamia Monœcia*, and to the natural order *Chenopodeæ*. Is a
 native of Tartary, and introduced in 1548. It is used as a substitute for spinach,
 and is much used in France.

ONION,—*Allium Cœpa*, (Linn.)—belongs to the class and order *Hexandria Mono-
 gynia*, and to the natural order *Asphodiceæ*. Neither the native place of the onion,
 nor the time of its introduction into Britain, can be correctly ascertained. Some
 suppose it to have originated in Spain, but it is more probably, a native of Egypt;
 the inhabitants of that country being partial to onions and garlic. It enters into
 the broths, soups, and other culinary preparations of almost every nation in Europe.
 This, like all the other allicious vegetables, is of great antiquity. The sorts in
 general cultivation are, the silver-skinned, early silver-skinned, a sub-variety of the
 last, yellow, true Portugal, the seed of which is seldom imported into this country,
 Spanish, two-bladed, Strasburg, globe, James' keeping, Deptford, pale red, blood
 red, Lisbon, Tripoli; these are all biennials. The Welsh, under-ground, tree or
 bulb-bearing onion, and scallion, are perennials. The Reading, white Reading, white
 Portugal, white Spanish, Cambridge, and Evesham, are supposed the same as the
 Spanish; the Dutch and Flanders are the same as the Strasburg. The Deptford is
 only a sub-variety of the Strasburg. The Dutch blood red, St. Thomas, are only
 varieties of the blood red. For pickling, the three former are preferred. The Spanish
 is much cultivated about Reading, and is a good sort for general crops; but the
 Strasburg is most universally cultivated, both for principal spring and autumn
 crops; the globe is a good onion, and much admired by some gardeners. James'
 keeping, originated some years ago with a person of the name of James, a market-
 gardener in Lambeth Marsh, and is a good keeping onion. The blood red is much
 cultivated in Scotland and Wales, and esteemed in the London markets only for its
 diuretic qualities. The Tripoli is the largest onion cultivated, but is a bad keeper.
 The Lisbon is a pretty good onion, but does not always ripen its seed in this country.
 Of the perennial sorts, the Welsh is esteemed for being hardy, and coming into use
 early in spring; it is a native of Siberia. The under-ground species has, of late
 years, been much cultivated in the Isle of Wight, and on the coast in the vicinity of

Portsmouth, as it comes in use before any of the spring-sown ones; and in that case, the cultivators find a ready market for them, in the purveyors for the East Indiamen and other ships destined for long voyages, which leave England at a season, when no other onion would be in a condition to take into their stores. It is a useful onion, and will afford a supply should the other crops from seed suffer by grubs or other accidents. It does not keep beyond February. This species has been erroneously supposed to have been brought from Egypt by the British army about 1805, but it was known in this country many years before that time. It is, and has been cultivated in Devonshire for many years, and is described as growing in Driver's nursery in 1796. It is cultivated in the vicinity of Grand Cairo, and esteemed among the Egyptians, who are partially fond of almost all the alliceous plants.

The tree, or bulb-bearing onion, *Allium cepa* var. *vivipara*, came originally from Canada, where the climate being too cold for onions to flower and seed, becomes (as in the cases of many Alpine grasses, for example, *Poa et Festuca Vivipara*) viviparous, and bears bulbs instead of flowers. This is one of Nature's grand provisions for the propagation of plants, when the summer is not of sufficient duration for the perfecting of the flowers and seeds, by the regular mode of impregnation, &c. By a mode peculiar to herself, Nature changes the parts of fructification from their natural dispositions, and forms them into bulbs or embryo plants, which, when sufficiently nutured, drop down, and either strike root that autumn, or else lie dormant till the return of another short summer, when they shoot up, and become plants similar to their parents. This curious mode of propagation is common in the Alpine regions, and is not only exemplified in the two grasses above-mentioned, but in that rare plant, *Saxifraga cernua*, in *Polygonium vivipara*, and many others. This species of *Allium* is not likely to come into general cultivation, although the cauline bulbs, when planted, become onions of a good size. It is our opinion, that the largest of the cauline bulbs are calculated for pickling; at least it would be worth while to make the experiment.

SCALLION. Miller mentions this as a distinct species; but some only consider it to be the Welsh onion, and others think it is a sort of hollow leek, a species of *Allium* grown in Pembrokeshire, and other parts of South Wales, with a cluster of bulbs like that of eschalots.

PARSLEY.—*Apium Petroselinum*, (Linn.)—belongs to the class and order *Pentandria Trigynia*, and to the natural order *Umbelliferae*. It is a native of Sardinia, and was introduced in 1548, but is now naturalized to Britain. It is found in waste places, but generally near old gardens. The sorts in cultivation are, the common plain-leaved, the curled thick-leaved, and the long-rooted or Hamburg parsley. The first is seldom cultivated, and should be exploded from our gardens, as, in its general appearance, it is often mistaken both for hemlock, *Conium maculatum*, and Fool's parsley, *Aethusa cynapium*, both of which are deleterious, the former being one of our most powerful vegetable poisons. The curled-leaved is both a much finer and a more beautiful sort, and, by generally adopting its cultivation, no risk would be run of mistaking it for either of the two plants above-mentioned. There is a sub-variety, called the giant-parsley, which grows large, and is preferable to the others. The Hamburg sort is cultivated for its long fleshy roots, and was probably introduced or much cultivated near Hamburg, from which place it derives its name. No seed sown in the culinary garden remains so long under ground as that of parsley: this circumstance should be taken into consideration at the time of sowing.

PARSNIP.—*Pastinaca Sativa*, (Linn.)—belongs to the class and order *Pentandria Digynia*, and to the natural order *Umbelliferae*. Is a native of Britain, and abounds in chalky fields, and road-sides in many parts of Hampshire, Surrey, and Kent. It is astonishing to see to what a depth the roots of this plant will penetrate into hard

chalky rock. By cultivation it has been much improved. In its natural state, it has a small hard root, and of rather an unpleasant taste, but, in its cultivated state, it has a large well-flavoured root, and abounds with saccharine and spirituous properties. It has long been an inhabitant of our gardens, but not so generally cultivated now as formerly. Amongst the Catholics it is a favourite Lent root, being eaten with salted fish. In some parts of Scotland the roots are dressed along with potatoes, and form a good dish for the children of the peasantry. Parsnep-wine is well known. In the north of Ireland, a table-beverage is prepared from the roots brewed along with hops. We have only one variety cultivated, but the French cultivate three: the *Siam*, the *Coquaine*, and the *Lisbonaise*. Of these, the first is the smallest, but best flavoured; the second is the largest, and cultivated chiefly in the islands of Jersey and Guernsey, where the roots sometimes attain the length of four feet, and are often sixteen inches in circumference, and rarely so small as six inches. This variety deserves the attention, not only of our cottagers, but also of our dairy-farmers, few vegetables being better for milch-cows; and in situations, where the soil is light, deep, and sandy, probably a better crop could not be grown for that purpose. The third variety, *Lisbonaise*, is nearly as good as the former, but does not grow to such a length, and probably would be better for field culture. Depth of soil, however, is not so material in the cultivation of parsneps, if all other circumstances be favourable; for, as has been already observed, their roots penetrate to the depth of three or four feet in solid chalk; nevertheless, the looser the ground is, the larger they will become.

PEA,—*Pisum Sativum*, (Linn.)—belongs to the class and order *Diadelphia Decandria*, and natural order of *Leguminosæ*. Is a native of the south of Europe, but when introduced into this country we have no certain account. In Queen Elizabeth's time, peas were brought from Holland, and were considered fit only for the nobility, being brought from so great a distance, and at such a great expense. Numerous varieties are cultivated in our fields and gardens, the principal of which are as follow: Bishop's dwarf early, Cormack's double-blossomed early frame, Perkin's early ditto, old or true early frame, early Charlton, early golden ditto, early Nichol's golden ditto, common Charlton, early single-blossomed, Reading hotspur, golden hotspur, dwarf marrowfat, tall marrowfat, green marrowfat or Patagonian, Knight's wrinkled, or marrow; Knight's new dwarf ditto, Spanish moratto, blue Prussian, white Prussian, egg, white rouncival, gray rouncival, tall sugar, dwarf sugar, crown or rose, true dwarf scymetar, sickle pea, dwarf blue imperial, improved ditto ditto, tall ditto ditto, new green nonpareil, royal dwarf; Leadman's ditto, Spanish ditto, prolific ditto, late Spanish ditto, early dwarf frame, for forcing, and Nanterre, or earliest French pea. Of these, Bishop's early dwarf, a new pea, raised by Mr. D. Bishop, in Perthshire; the early dwarf frame, true early frame, are the best sorts for forcing, or with the early Charlton, the best for early crops in the open air. The Charltons are profitable, as well as early peas, and are suited for cottagers, and small gardens, as are also all the varieties of dwarfs, as they occupy little ground, and other crops of vegetables may be planted between their rows. Of the middling tall growing sorts, the blue Prussian, dwarf marrowfat, are excellent bearers, and good-flavoured peas; and, of the tallest, the tall marrowfat and Knight's wrinkled marrow are the best; the latter is evidently, under good culture, the best-flavoured and profitable late pea that is now known. It is not so profitable to market-gardeners, nor to cottagers, as it requires stakes of seven or eight feet in height. Leadman's dwarf is a good late pea, and much esteemed for its flavour. The sugar-pea is used nearly in the same manner as kidney-beans; the pods being deprived of the inner tough film render them very tender. It was only introduced about the middle of the last century. It is much used in France. All the culinary plants of the natural order *Leguminosæ*, are of great antiquity, and it is probable that they were among the

first which attracted the attention of man in an uncivilized state. The nimble tailor, early May, or double-blossomed frame, is one of our best and earliest peas. It was imported from Holland in 1814. The pea, as an article of food, possesses great interest; the peasantry of Scotland make meal of it, of which they prepare a wholesome and nutritious bread.

PURSLANE,—*Portulaca oleracea*, (Linn.)—belongs to the class and order *Dodecandria Monogynia*, and to the natural order *Portulacæ*. Is a native of South America, and introduced in 1652. It is used in salads, and sometimes pickled. There are two varieties in cultivation, the green and yellow, or golden. By some they are made two distinct species, under the names of *Portulaca oleracea* and *Portulaca sativa*.

RADISH,—*Raphanus sativus*, (Linn.)—belongs to the class and order *Tetradynamia siliquosa*, and to the natural order *Crucifera*. Is a native of China, and mentioned by Gerrard, in 1584. There are several varieties in cultivation, and are divided into spring, autumn, and winter kinds. The following is from the Transactions of the Horticultural Society:—

The Spring and Summer kinds are, the “scarlet, or salmon-coloured, and its sub-varieties.—Short-topped scarlet, and early frame scarlet; which are the two sorts generally cultivated. Purple; an early sort, of good flavour, but at present neglected. Long white; the original variety, cultivated in Gerrard’s time, white semi-transparent and delicate.” these are long sorts. The turnip sorts are, the “white; root globular, like a turnip. Early white; a sub-variety. The pink; rose-coloured, scarlet, and crimson, are names applicable to one sort which approaches to the pear-shape.”

The Autumn kinds are, “White Russian; the root larger than any of the long-rooted kinds, white, tapering like a carrot, flavour nutty, like that of the rampion. Yellow turnip; root large, ovate, yellow, or dusky-brown, and rough without, but the flesh white. Round brown; root large, shape irregular, externally matted with greenish brown, and the flesh soft, and of a greenish white.”

The Winter kinds are, “White Spanish; root large, oval, outside white tinged with green, flesh hot, firm, solid, and white. Oblong brown; root middle-sized, pear-shaped, outside coat rough and brown, marked with white circles; flesh hot, firm, solid, and white, plant very hardy. Black Spanish; root large, irregularly pear-shaped, rough and black externally, and the flesh hot, firm, solid, and white; very hardy. Purple Spanish; a sub-variety of the black, with a purple skin.”

The roots are much esteemed as a salad, and are the only part of the plant generally used in a raw state. The pods are pickled, and considered a substitute for capers. Sometimes the tender tops are used along with other small salads; and they were anciently boiled, when full grown, and used as greens. The long-rooted are best for principal crops, although for variety, the turnip sorts are also sown during the whole of the summer. The Spanish may be stored for winter use, among sand or otherwise, with other winter roots.

RAMPION,—*Campanula Rapunculus*, (Linn.)—belongs to the class and order *Pentandria Monogynia*, and to the natural order *Campanulacæ*. Is a native of England, though not much cultivated. The roots are like a radish, and have a nutty flavour, which, with the leaves, are the parts used in spring salads.

RAPE,—*Brassica Napus*, (Linn. var. *oleifera* of Decandolle)—belongs to the class and order *Tetradynamia Siliquosa*, and natural order of *Crucifera*. Is a native of Britain, and found in corn-fields and cultivated places. The young seed-leaves gathered, are used with mustard and cress, in salads. It is much used in agriculture.

SAVORY,—*Satureja*, (Linn.)—belongs to the class and order *Didynamia Gymnosperma*, and natural order *Labiata*. There are two species cultivated: the—

Summer Savory,—*Satureja hortensis*. Is a native of Italy, and known in this country since 1652.

Winter Savory,—*Satureja Montana*. Is a native of the south of Europe, and known in this country since 1652. Both the species are cultivated in every garden, being used for seasoning, and other made-dishes in cookery.

SALSIFY,—*Tragopogon porrifolius*, (Linn.)—belongs to the class and order *Syngenesia Æqualis*, and natural order *Cichoraceæ*. Is a native of Britain, and has probably been naturalized. The *Tragopogon pratensis*, another plant of this family, was cultivated in the gardens in the time of Gerrard and Parkinson, but have been supplanted by the *Tragopogon porrifolius*. The roots are used either boiled or stewed, and the young shoots are used in spring as a substitute for asparagus.

SAVOY,—*Brassica oleracea*, var. *Sabauda*, (Linn.) *Brassica oleracea*, var. *bullata* of *Decandolle*—belongs to the class and order *Tetradynamia Siliquosa*, and natural order of *Cruciferae*. This is another of the many varieties of culinary vegetables which have taken their origin from the common white cabbage, the *Brassica oleracea*. This family is distinguished from all the others by the rugosity of its leaves, and is divided into the following varieties: the green, the dwarf, and the yellow savoy; and these again into the sub-varieties: the round, the oblong, and the conical or sugar-loaf shaped; all of them being excellent autumnal greens. The green savoy should be first used, as it is less hardy than the yellow, and the dwarf is the hardiest of them all. Any of them will, however, stand in ordinary seasons, till after the middle of winter.

SCORZONERA,—*Scorzonera Hispanica*, (Linn.)—belongs to the class and order *Syngenesia Æqualis*, and natural order *Cichoraceæ*. Is a native of Spain, the south of France, and Italy, and cultivated in the gardens of this country since 1576, mostly for its roots.

SEA-KALE,—*Crambe Maritima*, (Linn.)—belongs to the class and order *Tetradynamia Siliquosa*, and natural order *Cruciferae*. Is a native of our sea-shores, and has been used by the inhabitants of some parts of England, from time immemorial. The late Mr. Curtis was the first who brought it into general culture, although it had been cultivated partially in this country for upwards of two hundred years, and appears to have been sent to the continent by the two botanists, Lobel and Turner, but whether as a culinary or botanical plant does not appear. Parkinson and Bryant both say, that the leaves were used by the inhabitants of the sea-coast boiled, and eaten as cabbage; from which it derives the name of sea-cabbage, or sea-kale. It was probably first cultivated in the south of England, as we are informed, that it was brought to Chichester market, in a cultivated state, in 1753. It was cultivated by Dr. Lettsom in 1767, and by him brought into notice in the London markets. In Scotland, so early as 1774, directions are given for its cultivation by Gordon, in his *Gardener's Dictionary*, who recommends covering the beds, with sand or gravel, to the thickness of four or five inches. Although sea-kale be now a common vegetable, in every part of this country, it is singular, that the French, who are naturally fond of light vegetable food, should not more readily adopt its cultivation. It has one great advantage over all other vegetables of a culinary nature, which is, that it can be had nearly all the year in perfection. By repeated cutting, in cold situations, it can be obtained till the end of June, and again, by forcing, in November. It is not, like most other vegetables, injured, but improved by forcing. This vegetable is cultivated on a large scale by the London market-gardeners, several individuals having a number of acres under crop at the same time, and find a ready demand for it in all the markets of the metropolis. The price is about four shillings a punnet (a small basket) from December till April; and, after that time, seldom sells for less than half-a-crown or three shillings.

SCURVY-GRASS,—*Cochleria officinalis*, (Linn.)—belongs to the class and order *Tetradynamia siliculosa*, and natural order *Cruciferae*. Is a native of Britain, growing on many of our sea-shores. It is not generally cultivated in our gardens, but makes a wholesome ingredient in our salads, where it is required. Its medicinal properties are considered as anti-scorbutic. The variety, called Dutch scurvy-grass, is thicker, and more succulent in its leaves, and is the best for cultivation.

SKIRRET,—*Sium Sisarum*, (Linn.)—belongs to the class and order *Pentandria Digynia*, and natural order *Umbelliferae*. Is a native of China, and known in this country since 1548. The roots are the parts of the plant used, but at the present day are not so much esteemed in culinary preparations as formerly.

SPINACH,—*Spinacia oleracea*, (Linn.)—belongs to the class and order *Diœcia Hexandria*, and natural order *Chenopodeæ*. It is supposed to be a native of western Asia, but that is only conjecture. It has been cultivated here since 1568, but probably was known in this country long before that period. It is used in culinary preparations in various ways, and esteemed in all families. There are only two varieties cultivated: the prickly-seeded and the round-seeded. The former is preferred for winter and autumn sowings, being more hardy: the latter for general crops in summer, the leaves being more succulent and tender.

SPINACH, NEW ZEALAND,—*Tetragonia expansa*—belongs to the class and order *Icosandria Pentagynia*, and natural order *Ficoideæ*. This is a very recently introduced plant into our culinary gardens, and is an excellent substitute for spinach. It is a native of New Zealand, as the name implies, and was introduced by the naturalists, who accompanied Captain Cook to that country. It was discovered by them growing by the sides of woods, in bushy sandy places. It did not appear to them that the natives ever used it in any form. It was introduced in 1772 by Sir Joseph Banks, among many other seeds from the same country, and cultivated here as a green-house plant, but is now cultivated in almost every garden as a half-hardy annual, and is found to be about as hardy as the French-bean or nasturtium. A few plants, if properly managed, are found to be sufficient for a large family. It is dressed in the same way as spinach, and, when upon the table, can be distinguished only by few from the common spinach.

SPINACH, WILD,—*Chenopodium Bonus Henricus*, (Linn.)—belongs to the class and order *Pentandria Digynia*, and natural order *Chenopodeæ*. Is a native of Britain, and found plentifully by the sides of roads near villages, but seldom at a great distance from houses. It is cultivated in Lincolnshire in preference to the garden-spinach. The young shoots, peeled and boiled, are eaten as asparagus, and resemble that vegetable in flavor. It is not in general cultivation in the gardens.

SUCORY OR WILD ENDIVE,—*Cichorium Intybus*, (Linn.)—belongs to the class and order *Syngenesia Æqualis*, and natural order of *Cichoraceæ*. Is a native of Britain, and found by road-sides in calcareous soils. This plant is but little cultivated in this country, but is in high repute in Italy and France. When blanched, it has much the appearance of endive, and in that state is the *Barbe de Capucin* of the French. It has attracted the attention of both the French and English agriculturists, and has been cultivated by them as food for cattle. In Holland and Flanders it is extensively cultivated for the roots, which the inhabitants of those countries, and almost all the people on the continent, grind and use for coffee, either by itself, or mixed with a small portion of genuine coffee.

THYME,—*Thymus vulgaris*, (Linn.)—belongs to the class and order *Didynamia Gymnospermia*, and natural order *Labiatae*. Is a native of Spain and Italy, and has been cultivated in this country since 1548. It is a well-known fragrant plant, and cultivated in all culinary gardens. There are two species in cultivation, and three varieties of the first or common thyme, viz. the common narrow-leaved, and broad-

leaved, which is less common, and the variegated-leaved, which is grown for ornament.

THYME, LEMON,—*Thymus citriodorus*,—which has been supposed to be only a variety of the common wild thyme, *Thymus serpyllum*, but it is sufficiently distinct to form a species of itself. It is used much for the same purposes as the *Thymus vulgaris*.

TURNIP,—*Brassica Rapa*, (Linn. and Decandolle,)—belongs to the class and order *Tetradynamia Siliquosa*, and natural order of *Cruciferae*. Is a native of England, but is better known in a cultivated state. The roots are used in various ways in almost every family, and in all parts of Europe. In spring, the tops afford an agreeable and delicate green, and are acceptable to the mechanic and cottager, as well as to the peer. It is uncertain when turnips were first cultivated in Britain, for we find, that in the reign of Henry the Eighth, they were imported from Flanders, and were not cultivated here, as their culture was not then understood. In the low countries, and many parts of Germany, they have been cultivated as far back as the records of the history of those countries carry us. Sir Richard Weston is the first historian, who speaks of them as being cultivated as food for cattle in England, and that not until about the middle of the seventeenth century. Worlidge, writing in 1668, says, that flies are the greatest enemies that turnips have; and Ray, who wrote about twenty years afterwards, speaks of them as being cultivated in the fields every where in England, as well as in the gardens.

Turnips were cultivated in Hampshire, Berkshire, and Leicestershire, in the years 1698 and 1699. Mr. Lisle informs us, that his men, who hoed his turnips, had made it their peculiar business for twenty years.

It has been supposed that they were introduced into England by Charles Lord Viscount Townshend, but on the authority of Lisle, who made his observations between the years 1693 and 1722, this seems to be an error. It is however probable, that that patriotic nobleman greatly improved the mode of cultivating them, as he had an opportunity of seeing them in much higher perfection on the continent, where he resided for some time, being ambassador extraordinary to the States General in 1709.

They were certainly not in cultivation, except for the table, at the end of the sixteenth century, and so little were they known in 1588, that Cogan, in his Haven of Health, affirms, "That although many men do love to eat turnips, yet the swine by nature do abhor them." Neither Gerard nor Parkinson takes the least notice of their being cultivated in the fields. The former says, that small turnips were grown at Hackney, in a sandy soil, and brought to the Cross in Cheapside by the women of that village to be sold. In Scotland they were first cultivated near Stonelive, by Robert Barclay, Esq., of Urie, as an article of field-culture, and that enlightened gentleman brought the cultivation of them to very great perfection during his lifetime.

The sorts cultivated are, the early white Dutch, early stone, common round white, large round white, yellow Dutch, Aberdeen yellow, Maltese golden, green topped large round white, red topped large white, tankard, French, small round French, Swedish yellow stone, and black Russian. Of these, the two former are the best for early crops, and with the addition of the third, and yellow Dutch, and Aberdeen yellow for winter use, are quite enough for any ordinary garden. The Maltese golden is a handsome root, and it would be advisable to grow a few of them; as also of the Swedish, when transplanted for spring use, as affording a fine supply of greens as well as good roots. Where it is convenient to have turnips from the fields, it is better not to occupy the garden-ground with them for winter supply, as those from the fields will be found of a much better flavor.

SYSTEMATIC CATALOGUE

OF

CULINARY ROOTS AND HERBS,

ENUMERATING THEIR DIFFERENT SPECIES, AND PRINCIPAL VARIETIES
IN GENERAL CULTIVATION; WITH THEIR NATIVE PLACE OF GROWTH,
IF INDIGENOUS; AND IF EXOTIC, THE TIME OF THEIR INTRODUC-
TION INTO THIS COUNTRY.

ARTICHOKE,—*Cynara Scolymus*, (Linn.)—belongs to the class and order *Syngenesia Æqualis*, and natural order *Cynarocephalæ*. Is a native of the south of Europe, and introduced in 1548. There are only three varieties in general cultivation. The French or oval, the globe, and the dwarf globe; of these, the globe is considered the best for general crops, but the French is supposed to be better flavored. The latter is only a sub-variety of the globe, and valued as occupying less room than any of the others, and is therefore to be preferred for small gardens. Artichokes are used in almost all families, and are in much repute on the continent, entering in a variety of ways into French cookery.

ARTICHOKE, JERUSALEM,—*Helianthus tuberosus*, (Linn.)—belongs to the class and order *Syngenesia Frustranea*, and natural order *Corymbiferæ*. Is a native of Brazil, and introduced in 1617. The epithet Jerusalem is merely a corruption of the Italian word *Girasole*, (from *girare*, to turn, and *sol*, the sun,) or sunflower; the name artichoke is given to it from the resemblance in flavor which the tubers possess to the bottoms of artichokes. Before the introduction of potatoes, this root was in high repute. In the reign of Charles the First, Virginian potatoes (our common sort) were rare; but Canadian potatoes (our Jerusalem artichokes) were in common use. They are used for a winter and spring dish.

BALM,—*Melissa officinalis*,—belongs to the class and order *Didynamia Gymnospermia*, and natural order *Labiata*. Is a native of Switzerland and the south of France; was introduced in 1573. It is now little used in culinary preparations, but still retains its rank as a medicinal plant. It affords a grateful beverage in fevers, and is used in the making of balm tea.

BURNET,—*Poterium sanguisorbia*, (Linn.)—belongs to the class and order *Monœcia Polyandria*, and natural order *Rosaceæ*. Is a native of Britain, found abundantly on chalky downs. The leaves are sometimes used in salads, and occasionally in soups. It continues green all winter, but is now little used. It has been recommended to the attention of the agriculturist, as food for cattle.

BROOK-LIME,—*Veronica Baccabunga*, (Linn.)—belongs to the class and order *Dianthia Monogynia*, and to the natural order *Scrophularinæ*. Is a native of Britain, growing in every rivulet. The young tops are used like water-cresses for a salad, being more mild and more succulent, and only slightly bitter in taste. They need not be cultivated, at least in a garden, for a very little attention will procure an ample supply in any stream, where they grow naturally.

CHIVE,—*Allium Schœnoprasum*, (Linn.)—belongs to the class and order *Hexandria Monogynia*, and natural order *Asphodeleæ*. Is a native of Britain, and sometimes found in meadows and pastures. A small bed is sufficient for any family; the young tops are cut, and mixed with salads in spring. The peasantry make a favorite dish of them, chopped small, and mixed with oatmeal into a sort of pudding. The French use them as seasonings to omelets, soups, &c.

CAMOMILE,—*Anthemis nobilis*,—belongs to the class and order *Syngenesia superflua*, and natural order *Corymbiferæ*. Is a native of Britain, found in pastures. There are two varieties cultivated, the single and double flowering. The former, like all other single flowers, are the best for medicinal purposes; but the latter are most generally cultivated, as they afford a greater weight and quantity. They are highly useful in domestic medicine, and ought to have a place in all gardens, where they may either form a bed, or be planted for edgings, for which they are well adapted.

COSTMARY,—*Tanacetum Balsamita* (Linn.); *Balsamita vulgaris*, (*Hortus Kewensis*),—belongs to the class and order *Syngenesia superflua*, and natural order *Corymbiferæ*. It is a native of Italy, and introduced into this country in 1568. It is a highly aromatic herb, and its name, Costmary, intimates that it is the *costus*, or aromatic plant of the Virgin. It is but seldom used in this country for culinary purposes, and therefore is rarely to be found in kitchen-gardens. It is still used in France, and other parts of the continent.

CRESS, WATER,—*Nasturtium officinale*, (*Hortus Kewensis*),—belongs to the class and order *Tetradynamia siliquosa*, and natural order *Cruciferæ*.—It is a native of Britain, and found frequently in rivulets and ditches. Its cultivation was not attempted till of late years, but since 1808, it has occupied the attention of several persons, and we now see water-cresses cultivated in several places round London.

ELECAMPANE,—*Inula Helenium*, (Linn.)—belongs to the class and order *Syngenesia superflua*, and natural order *Corymbiferæ*. It is a native of Britain, was formerly in great repute, and cultivated in almost all the village-gardens throughout Europe. It is, however, seldom cultivated at this time, except as a flowering-plant in the borders, but it still holds its place as a medicinal plant of alexipharmick virtues, and for which it was probably so generally cultivated.

ESCHALOT,—*Allium ascalonicum*, (Linn.)—belongs to the class and order *Hexandria Monogynia*, and natural order *Asphodeleæ*. Is a native of Palestine, found near Ascalon. Introduced into this country in 1633. Its roots are much used in culinary preparations, in the manner of onions and garlic.

GARLIC,—*Allium sativum*, (Linn.)—belongs to the class and order *Hexandria Monogynia*, and natural order *Asphodeleæ*. Is a native of Sicily, the south of France, and also of Egypt, and was well known to the Egyptians long before the departure of the Israelites. It has been cultivated here since 1548. It is not very generally used in English cookery, at least in substance, but its flavor is communicated by steeping the cloves, as the bulbs are called, for a short time in the dish, and then withdrawing them. It enters more generally into French and Italian cookery than into the English. It possesses some medicinal virtues, for which it is cultivated.

HERB-PATIENCE,—*Rumex Patientia*, (Linn.)—belongs to the class and order *Hexandria Digynia*, and natural order *Polygoneæ*. Is a native of Italy, and introduced in 1573. Formerly this plant was cultivated as a spinach. It is now neglected, according to the opinion of Mr. Neil, "on account of the proper mode of using it not being generally known." It is still much used in Sweden as spinach.

HOP,—*Humulus Lupulus*, (Linn.)—belongs to the class and order *Dixciæ Pentandria*, and natural order *Urticeæ*. Is a native of Britain, growing in hedges, and cultivated to a considerable extent as an ingredient in the composition of beer. The

young shoots were formerly used like asparagus, and are said to be pleasant to eat. They are occasionally to be met with in the market, under the name of hop-tops. The hop is only cultivated in the gardens as a climbing plant, either to hide disagreeable objects, or as a curiosity.

HORSE-RADISH,—*Cochleria Aromatica*, (Linn.)—belongs to the class and order *Tetradynamia Siliquosa*, and natural order *Cruciferae*. Is a native of Britain, and is to be found in pastures, but more generally near villages, and in the vicinity of gardens. It has long been cultivated in our gardens, and is an article of considerable profit to the market-gardener. Its uses are generally known. The roots lose all their acrimony by drying, first becoming sweet, and then almost insipid. If kept in sand, in a cellar or other such place, the roots retain their acrimony for a long time.

HYSSOP,—*Hyssopus officinalis*, (Linn.)—belongs to the class and order *Didynamia Gymnospermia*, and natural order *Labiatae*. Is a native of the south of Europe, and introduced in 1548. This is not the hyssop of the ancients. The leaves are sometimes used as a pot-herb, but their principal use is in medicine. Three varieties are cultivated, differing only in the color of their flowers, which are red, white, and blue. The blue is the original color, and the most often cultivated.

LAVENDER,—*Lavendula spica*, (Linn.)—belongs to the class and order *Didynamia Gymnospermia*, and natural order *Labiatae*. Is a native of the south of Europe, and introduced in 1658. It is seldom or never used in domestic cookery, but is found in every garden, in which it is cultivated for its fragrant spikes, which are either dried, and kept in bags or small bundles, or distilled, and becomes then the well-known lavender-water of the shops. For this latter purpose, it is cultivated to a considerable extent, particularly at Mitcham, in Surrey, and Maidenhead, in Berkshire.

LIQUORICE,—*Glycyrrhiza glabra*, (Linn.)—belongs to the class and order *Diadelphis Decandria*, and to the natural order *Leguminosae*. Is a native of the south of Europe, and introduced in 1562. The planting and growing of liquorice began about the beginning of the reign of Elizabeth. It is only cultivated on a small scale in the gardens, but on an extensive scale in the fields, for the use of brewers and druggists.

MINT,—*Mentha*, (Linn.)—belongs to the class and order *Didynamia Gymnospermia*, and natural order *Labiatae*.—There are several species cultivated.

The *Mentha viridis*, spearmint, is the most generally used in culinary preparations, being an ingredient in salads, and imparting a flavor to several dishes, such as peas, sauces, &c.

The *Mentha pulegium*, pennyroyal, is used in different branches of cookery.

The *Mentha piperita*, peppermint, is less used as a culinary herb, but is more used for distillation, for which the other two are also cultivated.

POTATO,—*Solanum tuberosum*, (Linn.)—belongs to the class and order *Pentandria Digynia*, and natural order *Solaneae*. The question as to the country, from which this invaluable root first proceeded, has been as much the subject of argument as the birth-place of Homer. It is supposed by many to be of South American origin. Baron Humboldt says, that it is naturalized in many places there, but he doubts whether it be indigenous. Messrs. Sabine and Lambert agree in its being a native of the western coasts of South America, and also that it is found both in elevated situations in the tropical regions, and in the temperate districts of the western coast. It is supposed that potatoes were first brought into Europe by way of Spain, about the beginning of the sixteenth century, from the mountainous districts of South America, in the neighbourhood of Quito. It was introduced into Italy from Spain. In the year 1598, Clusius received the potato into the botanic garden at Vienna, from the governor of Mons, who had received it the preceding year from one of the attendants of the Pope's legate, by whom he was informed, that it was then in use

in Italy. Clusius cultivated, and disseminated it through Germany. Sir Walter Raleigh, or some of his attendants, are supposed to have brought it into this country, about 1586 from Virginia, and that it was planted by him on his estate of Youghall, near Cork, where it was cultivated and used, long before its value was known in England.

This excellent root was nearly condemned to destruction, by the apples or seed, which it produces, being by mistake taken for the eatable part. Fortunately, the spade discovered the real potato, and the root became rapidly a favourite eatable. It, however, long continued to be considered rather a species of dainty, than as an article of provision, nor was it till the close of the eighteenth century, that it was supposed capable of guarding the country in which it was cultivated from the horrors of a famine.

The potatoes of Shakspeare and other writers of his time, were not the potatoes of the present day, but the *Convolvulus batatus* or sweet potato, which were imported from Spain, and in use before the present potato was known.

“ Let it rain potatoes and hail kissing comfits.”

Merry Wives of Windsor, Act. V, Scene 5.

The potato appears to have been brought from Ireland to Lancashire, where it has been, perhaps, more successfully cultivated, than in any other part of England. Gerrard had them in his garden in 1597, and has given a figure of it in his Herbal, under the name of *Battata Virginiana*, and recommends the roots to be eaten as a delicate dish, but not as common food. They ought, he says, “ to be either roasted in the embers, or boiled and eaten with oil, vinegar, and pepper, or dressed some other way by the hands of a skilful cook.”

Parkinson says, that the tubers were sometimes roasted, and steeped in sack and sugar, or baked with marrow and spices, and even preserved and candied by the comfit-makers.

In 1663, the attention of the Royal Society was directed to the culture of the potato, and some measures were taken to encourage the more general cultivation of it on the score of national advantages. This measure brought the use of them to be more generally understood, but still they were held in no high estimation. Even after a hundred years had elapsed since their introduction, they were spoken of, as being only a root used by the lower classes in Ireland, sometimes as a substitute for bread, and occasionally boiled or roasted. Evelyn, who wrote in 1699, says “ in your worst ground plant potatoes, and take them up in November, gather them ever so clean, still enough of the tubers will remain in the ground for a stock.” Some of the writers on horticulture at a later period, take no notice whatever of potatoes, and others considered them less useful than either skirrets or parsneps. In Scotland, they were received and cultivated with enthusiasm, and they now form the chief support of thousands. At their first introduction, about the year 1725, which was as early as they were generally known in England, they were cultivated only in a few gardens in the vicinity of Edinburgh, and left in the ground for several years, and the few which were annually used were merely picked out of the ground as the occasion required, and the remainder were then covered with litter to protect them from the frost. It was not till after 1710, or probably 1745 or 6, that they were even known in the Highlands, and are said to have been introduced by the followers of Charles Stuart. They are now cultivated by the natives of the most remote isles, with a care and industry that are highly creditable to them, and the quality of the potatoes is superior to those grown in the south of Scotland, or in many parts of England, in more highly cultivated soils. They pay considerable attention to a change of seed and soil once every three or four years, by procuring tubers for planting from a distance. This circumstance, added to the potatoes being generally planted in what

is called new ground, or that which had long rested, or probably never before been in cultivation, may be the cause of their superior quality, and the absence of that common disease called the *curl*. Potatoes grown in fields are generally much better than those cultivated in gardens. The consumption is now so great of this valuable root, that for the supply of populous towns, fields of considerable extent are annually under this crop, and probably few crops pay the grower better. In the county of Essex, in 1796, it was ascertained that no less than seventeen hundred acres were under this crop, and from the vast increase of population, in the vicinity of London, it is supposed, that the extent is increased in proportion.

The varieties, which are extremely numerous, in consequence of new ones being often produced by seed, and the disposition of them to assume different habits, when long grown in the same garden, or field, may be arranged under two heads, each differing principally in colour, and each class having numerous sub-varieties. For garden culture, the following are the most useful:—

Whites. Early manly, early champion, royal dwarf, American early, early ash-leaved, early dwarf, and early frame; bread-fruit, oblong white.

Reds. Red kidney, red oval, Irish red, American red, bright red, round purple of red, and speckled purple or red, red apple, black skin, Lancaster pink-eye.

Of the *whites*, the royal dwarf, early manly, and champion, are esteemed for forcing, equally with the ash-leaved, and early frame. The American early is good for a secondary crop, and the bread-fruit and the oblong white, for later crops.

Of the *reds*, the red kidney, and red oval, which are often confounded, are both good sorts. The bright red is much esteemed in the vicinity of Manchester, for a principal crop, as is the Lancaster pink-eye. The black skin and red apple keep well: the latter is the best keeper which we have. The speckled purple is esteemed in Scotland for a principal crop. The names by which potatoes are known are so arbitrary, every country and almost every town having their own names for them, and each having their favourite sorts, that a list of names would be of little or no use.

ROCAMBOLE,—*Allium Scorodoprassum* (Linn.)—belongs to the class and order *Hexandria Monogynia*, and natural order *Asphodelæ*. Is a native of Denmark, and cultivated here in 1596. It is used by some as a substitute for garlic. It is not generally cultivated.

RUE,—*Ruta graveolens*, (Linn.)—belongs to the class and order *Decandria Monogynia*, and natural order *Rutaceæ*. Is a native of the south of Europe, and cultivated here since 1562. It is sometimes used as a medicinal herb, but never in the kitchen. It is supposed to have derived the name of rue from *rue*, to repent. It was called the herb of grace, from the circumstance of its being used by the priests, for sprinkling holy water among the people.

ROSEMARY,—*Rosmarinus officinalis*, (Linn.)—belongs to the class and order *Dianthia Monogynia*, and natural order *Labiatae*. Is a native of the south of Europe, cultivated here before 1548. It is seldom used in domestic cookery, but is occasionally used in medicine and distillation.

RHUBARB,—*Rheum*, (Linn.)—belongs to the class and order *Enneandria Trigynia*, and natural order *Polygonæ*. Several species are cultivated in our gardens, principally for the foot-stalks of their leaves, which are used in tarts and pies. Rhubarb has only of late years been cultivated as a culinary vegetable, but so great is the present demand for it, that it is supposed that there are above 100 acres in the neighbourhood of London under this crop; and Mr. Wilmot, of Isleworth, alone sends it to Covent-Garden Market by a wagon-load at a time.

The *Rheum palmatum* is a native of Tartary, and was long supposed to be the true rhubarb, but Mr. David Don, librarian to the Linnean Society, has lately shown that the *Rheum Emodi* of Dr. Wallich, is the medicinal plant. The *Rheum palmatum*

having hitherto been the supposed species. This has been attempted to be cultivated in this country for the supply of our druggists, but not with that success, which could be wished for so useful and safe a medicine. The Duke of Athol, some years ago, at the suggestion of the late Dr. Hope, of Edinburgh, carried the cultivation of this plant to a considerable extent, and his benevolent design was attended with considerable success. The roots, which he cultivated in the light sandy soils, similar to those of the Tartarian desert, grew to a considerable size, many of them were found to weigh fifty pounds, and to be equal in smell, taste, and effect, to those which we import at a considerable national expense. On being dried, they were found to shrink to one-quarter of their original weight. There is great reason to believe, that rhubarb cultivated in this country, is superior to that of foreign growth, the latter being gathered at all seasons, on account of the Mongall hunters, on their route, drawing up the roots indiscriminately, piercing them at one end, and slinging them on their belts; then leaving them to dry in their tents without further care. The scheme was ultimately abandoned by the Duke of Athol, and we believe has not since been attempted to any extent by any one else. It was introduced in 1758.

The *Rheum Rhaponticum*, is a native of Asia, and introduced here in 1573, and has been longer in cultivation than the others.

The *Rheum Hybridum*, is also a native of Asia, and introduced in 1778. This is considered the strongest growing species, and well calculated for culinary purposes, being more succulent than the *Rheum Rhaponticum*, and was brought into notice by Mr. A. Dickson of Edinburgh.

Rheum Tartaricum, is a valuable species, and requires no peeling in dressing; when cooked it is of a fine red colour, and continues to produce stalks longer than any of the other sorts.

Buck's Scarlet, as described in the Hort. Trans., is an excellent sub-variety, and well calculated for forcing.

SAGE,—*Salvia officinalis*, (Linn.)—belongs to the class and order *Diandriæ Monogynia*, and natural order *Labiata*. Is a native of the south of Europe, and introduced here before 1597. The leaves are used in a variety of forms in culinary preparations, and are employed often in medicine. Of this species there are several varieties; the red and green are the most common in cultivation; the others differ only in the size of their leaves, and are called broad and narrow-leaved sage. It is used in all families.

SAMPHIRE,—*Crithmum maritimum*, (Linn.)—belongs to the class and order *Pentandria Digynia*, and natural order *Umbellifera*. Is a native of our sea-coasts in particular places, such as Dover Cliffs and the Isle of Portland. Is used as a pickle, and sometimes as a salad. It has not been cultivated in the gardens with much success. The late John Braddick, Esq. attempted its culture, but succeeded only in a partial degree. It is not likely ever to become a plant of general culture. The *Inula Crithmifolia*, a native also of our sea-coasts, is used as a substitute for it, and is much more likely to be cultivated with success. The *Salicornia Herbacea*, another sea-side plant, is used for the same purposes, but not likely to become an inhabitant of our gardens.

SORREL,—*Rumex*, (Linn.)—belongs to the class and order *Hexandria Trygynia*, and natural order *Polygonæ*. There are several species cultivated, and of them some slight varieties, differing in the succulency of their leaves, which is their principal merit.

The *Rumex Acetosa*, or garden sorrel, is a native of our meadows and pastures, has long been in cultivation, and is used in soups, salads, and sauces, and very generally on the continent as a spinach.

The *Rumex Scutatus*, or French, Roman, or round-leaved sorrel, is a native of

France and Italy, and cultivated here since 1596. It is used for the same purpose as the last.

TANSY,—*Tanacetum vulgare*, (Linn.)—belongs to the class and order *Syngenesia superflua*, and natural order *Corymbiferæ*. Is a native of many places in Britain. The young shoots and leaves are used to give flavor to puddings, &c. It is not now so much used as formerly.

TARRAGON,—*Artemisia Dracunculus*, (Linn.)—belongs to the class and order *Syngenesia superflua*, and natural order *Corymbiferæ*. Is a native of Siberia, and cultivated here since 1548. It is used as a pickle, and for fish-sauce. In France it is employed, on account of its agreeable pungency, to correct the coldness of salad-herbs. It is also put into their soups and other compositions.

WOOD SORREL,—*Oxalis acetosella*, (Linn.)—belongs to the class and order *Dicandria Pentagynia*, and natural order of *Geraniaceæ*. Is a native of Britain, growing in almost all woods, and appearing very early in spring. The leaves are an agreeable salad, either alone or added to other salad-herbs; and they communicate an agreeable flavor when boiled along with greens.

A TABLE,

Showing the Quantity of Seed or number of Roots necessary to Sow or Plant in any given space.

1. *Alisander*, or *Alexanders*. The seed is sold by weight; and if sown to transplant for a bed, three feet and a half wide by six feet long, half an ounce will suffice: if sown to remain in a drill, forty-eight feet in length, one ounce will be requisite.

2. *Angelica*. An ounce of seed will be requisite to sow a bed, from which the plants will afterwards be transplanted, of twenty-four feet square.

3. *Artichoke*. For a row at two feet apart, and four plants in each patch, of twenty feet in length, forty plants will be necessary.

4. *Artichoke, Jerusalem*. For a row of one hundred and twenty feet in length, the roots being placed at two feet apart, half a peck or sixty roots will be sufficient.

5. *Asparagus*. If sown to transplant, one quart of seed will sow a bed of thirty square feet. If sown to remain for a bed, four feet and a half wide by thirty feet in length, one pint is necessary. If plants a year old, a bed four feet and a half by thirty feet in length, to contain four rows nine inches distant in the row, one hundred and sixty plants will be required.

6. *Anise*. One bed of twelve square feet will be sufficient for any family, for which half an ounce of seed is enough.

7. *Basil*. A quarter of an ounce will sow a seed-bed of four feet square, and when transplanted, fill a bed of forty-eight square feet.

8. *Beans*. For early crops, one pint of seed will be requisite for every eighty feet of row; for principal crops, two quarts for every two hundred and forty feet of row, and for late crops, the same as for early.

9. *Beans, French or Kidney*. For every eighty feet of row, the beans being at two inches and a half or three inches apart, half a pint will be sufficient.

10. *Beet, Red*. For every fifty feet of drill, one ounce is requisite.

11. *Beet, White*. The same quantity as the last, and so of the other sorts.

12. *Borage*. For a bed of twenty-four feet square, an ounce of seed is plenty.

13. *Burnet*. Half an ounce of seed will sow a bed of twelve square feet.

14. *Broccoli*. Half an ounce will sow a bed of forty square feet.
15. *Borecole*. All the sorts of these kales may be sown in the same proportion as the last.
16. *Brussels Sprouts*. One ounce will sow a seed-bed of forty square feet.
17. *Cabbage*. One ounce will sow a bed of forty square feet of the early sorts; for the more luxuriant sorts, one ounce will sow a seed-bed of sixty square feet.
18. *Capsicum*. A small paper, the produce of two pods of each sort will be plenty for most families.
19. *Cardoon*. For a trench of thirty feet in length, an ounce of seed is plenty.
20. *Caraway*. A quarter of an ounce is sufficient to sow a bed of twenty feet square.
21. *Carrot*. For a bed one hundred and twenty feet square, if sown broad-cast, one ounce will be requisite, and the same quantity for every hundred and fifty feet of drill-row.
22. *Cauliflower*. In the same proportions as broccoli and cabbage.
23. *Celery*. For a seed-bed of forty square feet, half an ounce is sufficient.
24. *Celeriac*. A quarter of an ounce is plenty for a bed four feet square.
25. *Chervil*. A quarter of an ounce is sufficient to sow a bed sixteen feet square.
26. *Clary*. A small bed, of about four feet square, will be sufficient for most families, for which a quarter of an ounce of seed will suffice.
27. *Coriander*. Half an ounce will sow a bed of twenty-four feet square.
28. *Corn-salad*. A quarter of an ounce is sufficient for a bed twenty-four feet square.
29. *Cress, Garden*. One ounce, or one-eighth of a pint, will sow a bed of sixteen square feet.
30. *Cress, American, or Black American*. If sown in drills, for every ten feet allow a quarter of an ounce.
31. *Cress, Winter*. The same proportion as the last.
32. *Cress, Curled, or Normandy*. The same as the last.
33. *Cress, Indian*. One ounce will sow twenty-five feet of drill.
34. *Cucumber*. From six to twelve seeds in each pot.
35. *Dill*. Half an ounce of seed is plenty for a bed twelve feet square.
36. *Endive*. For a seed-bed of forty square feet, half an ounce is sufficient.
37. *Egg-plant*. A small paper, the produce of two fruits, will be plenty to sow in most gardens.
38. *Fennel*. Half an ounce is sufficient for a seed-bed of twenty-four square feet.
39. *Finochio*. A variety of the former, the same proportion of seed as the last.
40. *Gourds*. From four to eight seeds of each variety, in separate pots, will be plenty for most families; excepting the vegetable marrow, where it is used, from twelve to twenty seeds will afford a supply.
41. *Kidney-bean*. See *Beans*.
42. *Leeks*. One ounce is sufficient for a bed of thirty feet square.
43. *Lettuce*. The seeds of lettuce require room; a quarter of an ounce is sufficient to sow a bed of forty square feet, and will produce upwards of four hundred plants.
44. *Love-apple*. A small paper of seed is sufficient for most gardens, or the produce of one or two fruits.
45. *Marjoram*. For a seed-bed of nine square feet, a quarter of an ounce is seed sufficient.
46. *Marigold*. A bed of sixteen square feet, will require a quarter of an ounce of seed.

47. *Melon*. From four to eight seeds in each pot, of No. 48 size; or double that number may be sown, if there be doubts of the goodness of the seeds.
48. *Mustard*. Sow in the same proportion as for garden-cress.
49. *Nasturtium*. See *Indian Cress*.
50. *Onion*. For every forty square feet, allow one ounce of seed.
51. *Parsley*. An ounce of seed will sow a drill fifty feet long.
52. *Parsley, Hamburg*. May be sown in the same proportion as the last.
53. *Parsnep*. Half an ounce of seed is usually sown on a bed of one hundred square feet.
54. *Peas*. For the small early kinds, one pint will sow a row of twenty yards in length; for the principal sowings of large sorts, the same quantity will sow thirty-three yards.
55. *Pompion*. See *Gourds*.
56. *Potatoes*. For a plot of the early and secondary crops, eight feet wide by sixteen in length, planted in rows fifteen inches apart, and nine inches in the row, a quarter of a peck of roots or cuttings. For principal crops, a compartment twelve feet wide by thirty-two in length, planted in rows two feet distant, and twelve inches in the row, half a peck of roots will be required.
57. *Purslane*. One-eighth of an ounce will sow a bed of sixteen square feet.
58. *Radish*. For each sort, a bed of fifty feet square, two ounces of seed will be required.
59. *Rampion*. Is not much used; and as the seeds are very small, one-eighth of an ounce will sow a bed of twenty square feet.
60. *Rape*. Sow in rather less proportion than for garden-cress.
61. *Savory, Summer*. A small paper, containing one-eighth of an ounce, will be sufficient for an ordinary-sized family.
62. *Salsafy*. One ounce of seed is sufficient for thirty feet of drill.
63. *Scorzonera*. The same as the last.
64. *Skirret*. The same as the last.
65. *Savoy*. The same proportion as cabbage, broccoli, &c.
66. *Sea-kale*. Two ounces will sow a seed-bed of thirty-six square feet; or, in drills, the same quantity will sow forty feet in length.
67. *Spinach*. Two ounces will sow a bed of one hundred and twenty square feet, if sown broad-cast; but if sown in drills, one ounce will sow the same space.
68. *Spinach, New Zealand*. Thirty or forty seeds will produce enough for an ordinary family.
69. *Spinach, Mountain or Orache*. One ounce will sow a bed of sixty square feet.
70. *Spinach, Wild*. Half an ounce will sow a bed of forty square feet, and will be sufficient for an ordinary-sized family.
71. *Succory, or Wild Endive*. Sow in the same proportion as for endive.
72. *Turnip*. Half an ounce will sow every hundred square feet.

A T A B L E

Of the different Culinary Vegetables, with the Time of Sowing, Planting, and Mode of Propagation.

Plants, &c.	No. of crops.	Time of sowing or planting.	Mode of propagation.
Alexander	Two	March, August	Seed.
Artichoke	One	March or April	Suckers.
Asparagus	One	March or April	Seed or Plants.
——— forced	Many.	Oct. Nov. Dec. Jan. Feb.	Plants.
Balm	One	March or April	Offsets, shoots, &c.
Basil	One	March or April	Seed.
Beans, early	Five	From Oct. to July	Seed.
——— late	Four	April or July	Seed.
Beets	One	February or April	Seed.
Borecole or kale	Three	March, April, June	Seed.
Borage	One	February or March	Seed.
Broccoli	Four	Mar. Apr. May, June, and Aug.	Seed.
Burnet	One	March or April	Seeds and roots.
Cabbages, early	One	August or September	Seeds.
——— late	Four	February, March, May, June	Seeds.
——— red	Three	February, March, June	Seeds.
——— savoy	Two	March, May, June	Seeds.
——— for cattle	Three	May, June	Seeds.
——— for seed	One	October or November	Seeds.
Vamomile	One	March or April	Parting roots.
Capsicum	One	March or April	Seeds.
Carrots	Three	Jan. Feb. March, April, July	Seeds.
Cauliflowers	Four	August, Feb. March, May	Seeds.
Celery	Five	Feb. March, April, May, June	Seeds.
Cardoons	One	March or April	Seeds.
Chervil	Two	March, August	Seeds.
Chives	One	March or April	Parting roots.
Clary	One	March or April	Seeds.
Coleseed	One	June or July	Seeds.
Coleworts	Two	February, June, or July	Seeds.
Corn-salad	Two	From March to August	Seeds.
Cress for seed	One	March or April	Seed.
——— for salad		March to September	Seed.
——— on hot-beds		October to March	Seed.
Cucumbers	Five	Jan. Feb. March, April, May	Seed.
——— on hot-beds	Three	January, February, March	Seed.
——— for bell-glasses	One	April	Seed.
——— on open ground	One	May or June	Seed.
Dill	One	March or April	Seed.
Endive	Four	April, May, June, July	Seed.
Fennel	Two	February, August	Seed.
Pinochio	Four	April, May, June, July	Seed.
Garlic	Two	February, September	Offsets.
Horse-radish	One	February or March	Cuttings of the roots.
Hyssop	One	March or April	Seed or slips.

Plants, &c.	No. of crops.	Time of sowing or planting.	Mode of propagation.
Jerusalem artichokes.....	One	February or March	Roots.
Kidney-beans	Five	March, April, May, June, July	Seed.
Lavender.....	One	May or June	Slips and cuttings.
Leeks	One	February or March	Seed.
Lettuces	Seven	February to August	Seed.
Marjoram	Two	March, April	Seed or roots.
Marigolds	One	February to April	Seed.
Mint.....	One	March or April	Roots, offsets, and cuttings
Mushrooms.....	Two	March, September	Spawn.
Mustard, for seed	One	March or April	Seed.
——— for salad.....		March to September	Seed.
——— on hot-beds		October to March	Seed.
Nasturtiums	One	March or April	Seed.
Onions, to draw young ...	Four	Jan. Apr. May, July, and Aug.	Seed.
——— principal crop ...	One	February or March	Seed.
——— for seed	One	February or March	Seed.
——— Welsh.....	Two	July, August	Seed.
Parsley	Three	February, March, July	Seed.
——— large-rooted	Two	February, April	Seed.
Parsneps	Two	February, March, or April	Seed.
Peas	Five	Oct. Jan. Feb. July, August	Seed.
Pennyroyal.....	One	March or April	Slips and roots.
Potatoes	Three	February, March, April	Cuttings of the roots and seeds: the latter to produce new varieties.
——— on hot-beds.....	One	January or February	
Purslane	Three	March, April, May	Seed.
Radishes.....	Nine	January to Aug. and Nov.	Seed.
——— on hot-beds ...	Two	January, February	Seed.
——— for salad		March to September	Seed.
——— for seed	One	May	Seed.
Rampion	One	March or April	Seed.
Rape	One	June or July	Seed.
——— for salad		March to September	Seed.
Rocamboles	Two	February or September	Offsets and cloves.
Rosemary	One	May or June	Cuttings and slips.
Rue	One	March or April	Slips, cuttings, and seed.
Sage.....	One	March or April	Slips and cuttings
Salsafy.....	One	March or April	Seed.
Savory.....	One	March or April	Seed.
Scorzonera	One	March or April	Seed.
Skirrets	One	March or April	Seed.
Sorrel	Two	March, August	Seed and parting roots.
Spinach	Six	February to July	Seed.
——— winter	Two	July, August, or September	Seed.
Tansey	One	March or September	Parting roots.
Tarragon.....	One	March or September	Roots, slips, and cuttings.
Thyme	One	March or April	Seeds, slips, and cuttings.
Turnips	Six	March to August	Seed.
——— for seed.....	One	February	Seed.
Turnip-cabbage	Two	May, June	Seed.
Turnip-radish	Two	From January to September	Seed

THE
FRUIT GARDEN.

INTRODUCTION
TO
THE FRUIT GARDEN.

NEXT in importance to the cultivation of culinary vegetables is that of fruits. Fruits have attracted the attention of man from the earliest period, and are supposed to have been the first vegetable production on which he fixed as an article of food. Of all fruits cultivated, the apple and fig are the most ancient. The vine is next in order; the fruit of which not only served as food, but also as a beverage. The almond, vine, and pomegranate were cultivated in Canaan, and, with the addition of cucumbers and melons, were known to the Egyptians from time immemorial. The Romans, in the zenith of their glory, had the merit of not only introducing many fruits into Europe, but also of bringing many of them from Italy into Britain. After the Romans deserted this island, the fruits which they brought were probably either neglected or entirely lost, for we find many of them a second time re-introduced by the Norman conqueror, and also by Henry the Eighth; and during the dark ages, they were carefully cultivated by the clergy, who, William of Malmsbury informs us, not only planted orchards wherever they resided, but also vineyards, and made wine. Wherever a monastery has stood, the remains of fruit-trees may be found; the monks were generally good gardeners, and displayed great skill in the choice of situation for their orchards; indeed this choice often regulated the situation of the cathedral, for they seldom established themselves in situations unfavourable for the rearing of fruits.

William of Malmesbury says, that the grapes produced in the vale of Gloucester were of the sweetest taste, and made most excellent wines. These vineyards were the sole property of the great barons, the monks, and abbots.

Although we have no vestiges remaining of the vineyards of the monastic times, yet we have many specimens of their orchards, which are still, in several instances, in a productive state; and although Henry the Eighth, by destroying many of the religious houses, dispersed and humbled the clergy, still he was attentive to the cultivation of fruits, and in his long reign, many were introduced into this country, amongst which, we are informed, were apricots, melons, and Corinth grapes. This monarch, at his palace of Nonsuch, in Surrey, cultivated in a walled garden, the then astonishing number of two hundred and twelve fruit-trees. In the same reign, Derbyshire and Lancashire were both celebrated for orchards, and Gloucestershire and Herefordshire long before that period. About the beginning of the sixteenth century, Arnold's Chronicles appeared, in which the art of grafting, planting, and altering fruits, both in color and taste, are treated on, and it appears to be the first treatise on fruits, that this country has produced; although long before that period, the cultivation of them had been attended to, not only by the monks, but also by the Druids. About this time, Cardinal Pole introduced the fig; and the orange and pomegranate were also cultivated at Beddington. During the reigns of Elizabeth and Charles the First, fruits were much attended to. Charles the Second planted fruit-trees in his gardens at Hampton Court, Carlton, and in Marlborough gardens; and Waller, the poet, in alluding to the two latter gardens, describes the mall in St. James' Park, as —

“ All with a border of rich fruit-trees crown'd.”

Sir William Temple and Sir Henry Caple cultivated fruit-trees, both as standards, and trained on walls; Switzer describes the trees of the former as being exquisitely well trained and nailed; and the latter as having the choicest collection of fruits in England, as well as being the most skilful and industrious cultivator. In the seventeenth and eighteenth centuries

fruits were multiplied and improved; and in the nineteenth, they appear to have arrived at a degree of perfection, which could not have been anticipated by our ancestors, while content with the fruits which our native land produced. To the exertions of Knight, Braddick, and others, we are indebted for many of our best fruits, and not only for the improvement of our native sorts, but also for the introduction of several foreign kinds.

The cultivation of good fruits requires the utmost attention of the gardener. The introduction of a worthless culinary annual, or perennial vegetable into a garden, is a loss comparatively trivial to the introduction of a worthless, or bad fruit-tree; the one only disappoints us for a season, the other for a number of years. The one can be rectified, perhaps the same year, if not, the succeeding one; but the other requires many years to arrive at that perfection, which will enable us to judge of its merits. The disappointment is therefore great, when we expect to be repaid for our trouble and anxious care for years, by seeing ourselves in the possession of a fine fruit, to find it at last a fruit of less merit than any other in the garden; yet nothing is of so frequent occurrence.

It is the fate of man to fall into error, and to overshoot the mark, when over-anxious in the pursuit of certain objects, and perhaps, in no instance, is the truth of this maxim more clearly exemplified than in the cultivation of fruits. It has become fashionable, and it appears to be the *primum mobile* of certain horticulturists, to cultivate varieties and sub-varieties of fruits beyond all reasonable bounds; many of which are disseminated over the country to the disappointment of hundreds. True it is, that new, or improved fruits, are only to be obtained by propagating many varieties, out of which those only of a superior quality should be chosen. This is a laudable pursuit in the horticulturist, and to many eminent and intelligent gentlemen and gardeners, we are indebted for their unwearied exertions in this particular branch of horticultural science; but it is to be regretted, that more attention and caution have not been exercised in distributing those sorts, which are of real merit, and consigning the less worthy to the fagot-pile. Collections of fruit seem now to be more appreciated, in pro-

portion to their extent in the number of varieties, than in their actual merits. It is better to be contented with a few real good kinds, such as will be productive in most seasons, than to plant many sorts (even of those which are reckoned the finer) for the sake of variety, of which a crop is obtained only once in three, five, or seven years. Existing circumstances should determine both the sorts and the number of varieties planted. In fine climates, soils, and situations, such as many parts of Devonshire, Somersetshire, Herefordshire, and Worcestershire, and in some situations in the vicinity of London, the finer sorts may be expected to repay and amply satisfy the proprietor; while to plant the same sorts in cold bleak situations and bad soils, would be attended with disappointment. The circumstances of the situation being taken first into consideration, the number and sorts should then be fixed upon, and out of the almost endless catalogue of fruits now to be had, sorts will be found to suit all reasonable situations; the chief difficulty, however, consists in making a proper selection. Few private gardens should contain more than twenty-five or thirty sorts of apples, twelve or twenty sorts of pears, and so in proportion with the other small fruits, such as strawberries and gooseberries excepted, as they occupy little room, and are soon in that state of bearing as to convince the owner whether they be or be not really worthy of his cultivation.

By limiting the varieties of fruits in private gardens, we may be accused of wishing to cast a damp on the zealous efforts of the present cultivators of new and improved fruits; but this is quite foreign to our views; indeed, we consider no stimulus too great for promoting that laudable object, which every horticulturist should constantly bear in his mind; but still this aim should not be carried to the extent of depriving the proprietor of a supply of standard fruits, sufficient for the consumption of his family. A great neglect has been shewn, of late years, in the planting of many of our best standard fruits, and in some cases, they are totally banished from the garden to make way for new ones, the merits of which are scarcely known, having been raised from seed imported from the continent, or recommended by some enthusiast with a

Flemish or French name, which is, perhaps, the only thing that can be said in their favor. And thus, we find many gardens, which once were noted for the quantity and excellence of their fruits, now scarcely having one out of some hundred sorts, which is fit to eat, and in consequence, the owner is often obliged to apply to the nearest fruiterer to complete his dessert. We would recommend to all, who have it in their power to propagate from seeds of approved sorts, particularly if they have been assisted in the important office of impregnation, by destroying carefully the pollen of one sort, and introducing that of another, as the most likely means of producing a variety participating of the good properties of both; and, when the young plants are of sufficient strength, to plant them out in some favorable situation in the shrubbery, or otherwise, until they prove by their fruits whether they do or do not deserve a place in the garden. By judiciously arranging them in the shrubbery or arboratum, they will harmonize with the other trees, and, at certain seasons, produce an agreeable effect, either by their flowers or their fruit. Those which are likely from their habit, to be approved of as distinct sorts, may be brought to fruit sooner by grafting, or budding them upon an established tree. It will happen, in most gardens, that a particular sort may have been by accident planted, the fruit of which may be of little value; in such cases, let this tree be fixed upon for a stock, on which to work any of the seedlings, that it may be desirable, from their appearance or other causes, to be proved, sooner than they would be by remaining on the seedling tree. By this method, a great many may be proved annually without the least inconvenience. The necessity of renewing fruit-trees by seed, for the purpose of either renewing the identical sort, or endeavouring to procure a new or a better one, is obvious, as the various methods of propagation by grafting are, in no instance a renewal of the sort, or, in other words, making a new or young tree, for the case is wholly different. Every tree so propagated is no more than a prolongation of a part of the parent tree, by being amputated, and made fast to another root by means of grafting. There is no such thing as a new or young tree, excepting those, which are really raised from

seed. Every Ribston pippin in the kingdom, propagated by any other means than by seed, is no other than a part, a wing or a branch, of the original Ribston, discovered at Ribston Hall, in Yorkshire, and that such trees, it is supposed, do not only inherit the properties of the parent in size, shape, and flavor, but they also inherit all the train of diseases with which the original was affected. This is an important consideration, and deserves the most serious attention, as we see many of our old and standard fruits fast hastening to decay. Mr. Knight and others have discovered this in the Herefordshire orchards, in which many of the esteemed fruits, and which were really good one hundred years ago, are now scarcely so good as the wild apple in the hedges. Apples removed from one country to another are sometimes materially improved by the removal; thus, the Balgon pippin, an esteemed Scotch apple, similar to the golden pippin, is supposed to be nothing else than the golden pippin imported from England, about the period when that fine apple was in its prime. The case is the same on the opposite side; the Ribston pippin, originally brought from England into Scotland, is there one of the finest apples in the country, and deserves a south wall in many places, much better than some of the inferior peaches; while, on the other hand, when it has been again brought into England, it is not to be compared to many even of the third rank of merit. Although the Hawthorndean may be an exception to this rule, it is an excellent Scotch kitchen-apple, and is the same in the south of England. Many of the old apples and pears now growing in the old monastic orchards, appear to us to be of little merit, and we generally content ourselves with the idea, that they may have been esteemed by a monk of the twelfth century, because he had no better; but, at the same time, it is probable, that the same apple or pear was then little inferior to our Jargonelle, or summer Boncretien. We have had an opportunity of observing an instance of this kind, in the garden of the clergyman of Kenmore, in Breadalbane, in which there is a Jargonelle tree of huge dimensions, and which probably has been a scion of one of the trees in the orchard of the nuns of Loch Tay, which is contiguous to it. This tree continues to bear a great crop of fruit annually, but

even in the remembrance of several people still living, it has so much degenerated, as to be very unlike to what it was in the early part of their remembrance. We meet with few good pears among the many old trees existing in those old orchards, but we may reasonably satisfy ourselves that they were fruits of great merit when in their prime. The most probable cause of this degeneracy is their having stood for many years upon the same spot, and, by the absorption of their roots, annually exhausted that nourishment, which is destined by nature for them, to which it may be added, that no fresh food is supplied them by the addition of manures, or other matters containing the necessary food of plants. It is probable, if some fruit-trees were supplied, as occasion required, with proper food, they might live as long as the poet has ever supposed the oak to live. We observe in the lower orders of vegetables, that change of place is necessary for them; a plant whose roots are prisoned within a pot, soon exhausts all the nutriment in the ball of earth that surrounds the roots, and when that is the case, it soon ceases to flourish; but if re-potted, and fresh mould given it to live in, it soon shows the change by assuming its wonted luxuriance. Hence we see the necessity of choosing good soil, either naturally or artificially made, for our fruit-trees.

CHAP. I.

SITUATIONS AND SOILS FOR FRUIT-TREES.

FRUIT-TREES are planted either for the supply of the proprietor's own table, or on a larger scale for profit, by disposing of the produce in the market, or in making the well-known liquors, cider and perry.

Plantations of fruits for the latter purposes may be considered under the same head, as they are for the most part cultivated in what is generally called an orchard, and the sorts are neither so select nor so well cultivated. Those for the former purpose are cultivated on a less scale, and the selection

of fruits is usually more limited, and is generally understood by the appellation of the fruit-garden.

With respect to the situation of public orchards, it should be rather elevated than low, as on a gentle declivity, inclining to the south, a free admission of the rays of sun and air is obtained, which is requisite to dry up the damps, disperse the fogs, render the trees healthy, and give a fine flavor to the fruits. It should be likewise well sheltered from the east, north, and west winds, by plantations, if not naturally sheltered by hills or rising grounds. Many orchards are admirably situated by the sides of rivers, sheltered by the winding banks, and sloping to the south, east, or west. Where plantations are necessary for shelter, they should not be either too high, nor too near the orchard, as where that is the case, they prevent a free circulation of air, which is of as much injury to the trees as if they were not sheltered at all. The soil is of more importance probably to the welfare of the trees, than any particular shelter, excepting in very bleak and exposed places. In the cider counties, we see orchards, in all situations as regards shelter, thriving almost equally well; we often see them on the tops of hills exposed to all the winds that blow; we see them in valleys sheltered from every wind; yet both seem to pay the proprietor to his satisfaction, or else they would be soon rooted up. No rule can be laid down to specify exactly the soil most suitable for fruit-trees, neither is it to be supposed that every one, who wishes to plant an apple-tree, has that choice in his power. There is no doubt that certain soils are more fitted for the cultivation of fruit-trees than others; hence we find orchards thriving in soils not considered by any means good; while, on the other hand, we find, in soils supposed to be excellent, that they will scarcely flourish at all. In those situations, where fruit-trees are observed to thrive, cultivation ought to be extended; and in those which are found from experience to be unfit for them, they should not be attempted, at least with the intention of making them a source of profit in trade. The majority of fruit-trees will thrive in a loamy earth of a middling texture, providing it lie on a wholesome substratum, and be of a competent depth. We frequently meet with an excellent situation for an orchard, where

the soil is various; where some is good, and some is very indifferent; in such cases, we must either improve the bad soil, or in planting, suit the different kinds of fruits to the nature of the different soils contained in the intended orchard. It would be a fruitless task to plant where the bottom is not naturally dry, or capable of being made so by draining. Wet, heavy, stubborn soils, are to be avoided equally so with soils which are of a light, sandy, sterile nature. The shining gravelly soils disagree very much with fruit-trees, unless there be a good quantity of loam intermixed with them. On a soil rather shallow, and on a chalky bottom, they seldom succeed; and where the bottom is a cold spongy clay, they seldom thrive. But where such is the case, and other circumstances combining, the ground may be prepared by trenching, and elevating the stations for the trees above the general level, which will in a great measure secure their roots for some time from penetrating into the noxious sub-soil. When trees are planted in such situations, the roots may be prevented from extending to an unnecessary depth, by placing rough pavement under them, or laying a floor of brick, or forming one of clay and coal-ashes, allowing both to be pretty dry before the trees are planted. To each tree planted may be given three or four wheelbarrows full of good surface-mould, which has been prepared for them for some previous months by frequent turning and exposure to the atmosphere. Dung should be avoided in all cases, unless the soil be very poor indeed, and then it should be of the rottenest description, as nothing tends to produce canker and gum so much as strong dung, although we see it practised daily by many who, in other respects, are excellent fruit-growers. In regard to the size of an orchard, that must be regulated entirely by the use for which it is intended, as well as the quantity of fruit expected; also the quantity of cider or perry intended to be made; and the extent of ground fit for the purpose, or which can be conveniently spared.

SEASON OF PLANTING.

In regard to the season of planting, it may be performed with success at different periods, according to the nature of the land. The best time for planting dry soils is in October; but if in wet soils, the end of February or March is better. The chief principle in this business is to suit the trees to the soil, and to plant them at proper distances from each other. Fruit-trees, when planted too thick, are supposed to be liable to blight, and become overgrown with various species of *lichens*, and other mosses, particularly the family of *Ramalina*, which are the most injurious to, and the most frequent on fruit-trees, and are supposed to rob them of their nourishment, but this is not satisfactorily proved; on the contrary, it rather appears that they live on the moisture of the atmosphere, which is always the case where trees are closely crowded. The circumstance of *lichens*, and other mosses, living and growing on the hardest granite, and even on iron, is an argument against their robbing the trees of any share of nourishment. As their roots are very minute, and incapable of insinuating themselves into the bark of trees, it is probable that they do not extract their nourishment from them, at least not to such an extent as to injure them. Their appearance on fruit-trees is more rationally accounted for on the following grounds. We never see parasitic plants of the *Cryptogamous* class growing on trees in a truly healthy state, but we uniformly find them abounding on trees which are more or less in a state of sickliness, and approaching to decay. The more unhealthy a tree is, and particularly if its disease have been brought on by being shaded, so as to prevent a free circulation of air, the more profusely will it be found to be covered with innumerable species of mosses and fungi.

The tree must be already diseased, and the pores of the epidermis closed up, and transpiration obstructed, before it can be in a fit state to become the place of growth of those vegetables. The juices of the trees must be first vitiated, from some cause or other proceeding from the soil or situation, and the blight or mildew, which is a very minute parasitic fungus,

then makes its appearance, and as the tree becomes more diseased, the more profusely will the fungi appear. The blight was well known to the ancient Greeks, but they were totally ignorant of its cause. They regarded it merely as a blast from heaven, indicating the displeasure of their offended Gods, and that it was perfectly incurable. The Romans also knew it under the denomination of *rubigo*. They regarded it in the same light as the Greeks, and supposed it under the immediate direction of *RUBIGUS*, one of their gods, whom they always invoked, that the blight might be kept off from corn and trees. It is at the present time well known both to the agriculturist and gardener, and has been very differently accounted for; indeed, in proportion as words have multiplied upon the subject, the difficulties attending its elucidation have increased.

PROCURING THE TREES.

In providing trees to plant an orchard, it is well to choose them from some eminent fruit-tree grower, as less risk is run in being deceived in the sorts; and in making a selection, it is better to be content with fewer sorts, provided that they be good, than to introduce a number, and then to have to grub up one half of them, when they have arrived at maturity. It is of importance to choose them from a soil similar to that in which they are to be planted, or as near to it as can be obtained, but if it be a worse soil, so much the better. Trees are found to thrive best that have been grown on a poor soil, when they are removed to a better; and trees grown in a rich soil, when transplanted into a worse, seldom recover the change. Care should be taken to choose such as are, to all appearance, free of canker, or which are not bruised or damaged. They ought to be chosen the summer before planting, and then carefully examined to see whether they be affected with insects, which, if it be the case, they should by all means be rejected. It is always better to pay double price for clean healthy trees, than take those which are unhealthy even as a gift. If the orchard, which is generally the case, is to be ultimately pastured with cattle, choose standards having clean straight stems

of four or five feet in height; the apples being wrought on crab-stocks and the pears on free-stocks, and commonly such as are one or two years from the graft. In this instance, the Herefordshire orchardists commit an error, by planting trees often five, six, or more years from the graft, expecting thereby to have them in fruit sooner, and that they will not be so liable to be injured by cattle; but they would be more successful if they planted younger trees, and were at more trouble in protecting them, not only while young, but also when they are fully established. Care should also be taken, in taking them up, that their roots be not bruised nor twisted, and that they be carefully packed, if sent to a distance.

PLANTING THE TREES.

In regard to the proper distance for planting the trees, it should be regulated by the natural growth or spreading of them when fully grown, as well as by the goodness of the soil. It was formerly the practice to have them planted in lines of not more than eight or ten yards apart, but latterly they have been justly planted at a greater distance. From thirty to forty-five feet is the distance given in most of the cider counties; but this ought to be regulated by the soil and sort of trees. If planted in a cold, bleak, exposed situation, and in a poor soil, where the trees are not expected to grow to a great size, twenty-five or thirty feet are sufficient; whereas in a good soil, and sheltered situation, a distance of forty or forty-five may not be too great.

Cherries and plums may be planted at from twenty to thirty feet, according to the soil and the goodness or badness of the situation. But it is advisable, in the first planting, to plant four trees for one that is finally to remain at the above distances, planting the proper kinds at the distances as above-mentioned, and then the temporary plants between them each way, which temporary plants should be some of the freely growing sorts, that fruit early, such as the white or Caswick codlin, white Hawthorndean apples, May-duke cherries, and Crawford and other early fruiting pears; or any others known in the country where the orchard may be planted, that will fruit

as early, if not earlier, than those just mentioned. These should be considered and treated as temporary plants from the beginning, and must give place to the principal trees, as they advance in growth, by being pruned away by degrees, and at last grubbed up entirely. In bleak and exposed situations, there can be no objection to introduce a few forest-trees judiciously among the fruit-trees, to shelter and nurse them up; the forest-trees to be cut away by degrees as the others get up, and ultimately taken away altogether. In this operation choose those which are of most rapid growth, such as poplars, plane, &c.; round the boundary of the orchard, Scotch geans, a small sort of hardy cherry, filberts and other nuts, quinces, service-trees, &c. should be planted; and to these, walnuts and chesnuts should be added: they will of themselves form a good shelter, and will by their fruits pay well for the ground which they occupy. Medlars, mulberries, &c. should be added to the other fruit-trees in the orchard, and all sorts of fruits that will ripen upon standards. In the process of planting, at whatever season of the year, and in whatever soil, care should be taken to have a sufficient quantity of puddle made, by pouring an adequate quantity of water upon the ground, and by stirring it about, so as to make a puddle of rather a thick consistency, through which gently draw the roots of the trees two or three times, or as often as necessary, until the roots be covered well with the puddle. This will be of much service to them, and will not only keep the roots moist, but will greatly encourage the emitting of young roots immediately after planting. Where this is not done, the same end will be obtained by giving a supply of water to the roots, as the mould is put about them in the process of planting. As soon as the trees are planted, they should be prevented from being blown about by the wind, by being supported by proper stakes or other props, for where this is not attended to, much injury is done to the young tender fibres; the ground is also opened by the stem pressing the mould away on all sides, thus leaving a hole, by which, in the first place, too much wet penetrates to the roots of the tree, and the frost succeeding, freezes the whole into a solid mass; its expansive power tears and lacerates the roots, and in spring they will ultimately be destroyed by the

sharp drying winds. More trees, both fruit and forest, are destroyed by not paying sufficient attention to this point, than by any other cause whatever. Great care, however, must be taken in staking up the trees to prevent rubbing, for the friction produced by the tree rubbing against the prop will soon lacerate and bruise the bark, canker follows, and the tree is ruined. To guard against this evil, a piece of old mat or a small bundle of soft hay should be introduced between the stem of the tree and its prop, and the whole neatly tied together with a piece of tarred cord, taking care not to tie the cord too tight, which would prevent the stem from swelling. In situations where hares or rabbits are likely to get in to injure the trees, care must be taken to protect them from their attacks. Many modes have been adopted to preserve the stems of trees from these animals, but the most effectual and surest method is to clothe the stems with an envelope of moss, short grass, or litter, wound round with shreds of matting or rope-yarn; this not only protects them from hares, but is of great use the first year after planting, to keep the bark moist, and thereby aid the ascent and the circulation of the sap in the alburnum. This operation should be performed immediately after planting, and left on till by decay it drops off of itself: it is of singular service in late planting, or when, from unforeseen circumstances, summer planting is necessary. When this envelope drops off, and exposes the stems again to their attacks, let it be a rule, before the approach of winter, to bush them round with thorns, which will, if properly effected, preserve them, and will not injure them; or they may be again bound round with hay-bands, from the surface as high as it is likely that the animals can reach; this, if properly put on, will remain for two years. In a few years the trees will be sufficiently proof against them, unless in very severe weather. The first summer after planting, the young trees should be occasionally supplied with water according to circumstances; and this should be administered with a bountiful hand. In order to prevent as little of the water being wasted as possible, make a basin or hollow round the stem of each tree, which will contain the water until it soaks down to the roots. Fill this basin with littersy dung to the thickness of five or six

inches, and to prevent its being blown about, cover it with a little mould. This nourishes the young roots, by preventing the drought from penetrating to their injury. It is also of consequence to cover the ground round the roots with long littery dung or fern, in order to prevent the frost from reaching the roots, during the first winter after planting, that is, if they have been planted in autumn; after the first year this need not be done. In planting all sorts of trees, particularly fruit-trees, great care should be taken not to plant them at too great a depth. In good soils it is injurious to them, as it buries their roots so deep, as to be beyond the reach of the rays of heat, and induces them to go deeper for that nourishment which they can only find near the surface. Almost all roots are disposed to run to a certain degree horizontally, and if planted too deep, they can never approach near enough the surface, where their nourishment is prepared for them. In bad soils, it is better to plant upon the surface, or nearly so, and gather the mould round into a hill, which, by being increased as the tree advances in growth, will materially promote its welfare, by supplying it with fresh nourishment as the roots diverge from the centre. In planting extensive orchards, there can be no objection to cultivating the ground between the rows of trees; care being taken, for the first years of their growth, that no injury be done them by the plough or spade. Such crops as potatoes and turnips will rather benefit the trees than otherwise; for the operation of preparing the ground for such crops will ameliorate the soil, and tend to improve the trees: the trees should not be planted promiscuously, those of high lofty habits should be planted upon the elevated spots, or be planted by themselves to form a sort of back ground, and the less lofty sorts in the middle, while the lowest of all should occupy the front.

The trees when planted in this manner will have a fine effect when grown up; but if they be planted promiscuously, they will not appear so agreeable to the eye, independently of which the smaller trees will be shaded by the larger ones, which will not only injure them, but spoil the flavor of the fruit. The trees, where cattle are allowed to pasture, should be protected from their browsing, or rubbing against their

stems, particularly when young, by placing a triangular fence round each tree, and a few branches of thorn drawn through their upper rails. That curious plant *Viscum album*, the mistletoe, is very injurious to many apple-trees in countries where it abounds. It should be eradicated wherever it appears, for if not attended to, it grows so rapidly as to shade the fruit, and prevent the necessary circulation of air among the branches.

CHAP. II.

THE PRIVATE ORCHARD OR FRUIT-GARDEN.

SITUATION AND SOIL FOR THE PRIVATE ORCHARD OR FRUIT-GARDEN.

WITH respect to private orchards or fruit-gardens, it is often necessary, and always proper, to connect them with the culinary garden, provided circumstances will admit of it. In choosing the situation, in providing shelter, and improving the soil if it be necessary, more attention is required than in the orchard already described. There, only such trees will be introduced, as are known from their hardy constitution to be likely to bring their fruits to perfection without having recourse to artificial means; but in the fruit-garden the case is different, here, the finest and more tender fruits will be planted, many of which will require great skill and attention from the cultivator to bring them to any degree of perfection, and therefore we should be more particular in choosing a proper situation and soil. The most eligible situation for a fruit-garden, considered as such, may be placed upon any side of the kitchen-garden most suitable to the situation and nature of the ground, and according to convenience; or it may surround the garden, either simply as an orchard, or as an orchard and shrubbery or arboratum combined. Where economy is an object, and where

there is not sufficient scope, perhaps the latter way may be the most advisable. Where there is plenty of room, a separate fruit-garden may be made on any side of the garden that may be considered most eligible, in which not only the larger sorts of fruits, such as apples and pears, are to be grown; but all others, such as cherries, plums, gooseberries, currants, raspberries, strawberries, &c., so as to obviate the necessity of crowding the kitchen-garden with them; indeed, such is our view of the case, that we should wish to see no fruits cultivated in the kitchen-garden, excepting on the walls, and probably strawberries in the quarters, as a resting crop for the soil. This sort of orchard should be so arranged as to produce a good effect when the whole are grown up. The larger trees should be arranged, as hinted at in the planting of public orchards; the ground may be here cultivated with culinary crops, which will increase the surface for that purpose, and give ample opportunity for resting the soil by having a certain proportion either under grass or summer fallow, as advised in the article on the rotation of crops. Under the trees, in hot sultry weather, many vegetables will prosper, which would not thrive so well if fully exposed to the full sun. Strawberries generally thrive in moderately shaded situations, as well as almost all other of the small fruits, shaded groves being their natural place of growth. The distance that the trees should be planted from each other must depend on the size of the ground, the sorts of trees planted, whether standard, dwarfs, or espaliers, the latter of which, though not commonly planted in orchards, deserves to be more particularly encouraged. Maiden plants, or such as are from two to three years from the bud or graft, should be preferred to older trees. The distance at which standard trees should be placed need not be more than from twenty to thirty feet. Dwarfs will require a little less, for as they will not be allowed that scope, as in public orchards, less room will be sufficient for them. Espaliers may be planted on iron or wooden trellices or railings, of from four to eight feet in height, and the trees should stand according to their kinds and mode of training. Apples, eighteen or twenty feet, if fan-trained, and from that distance to thirty, if horizontally trained; the latter is probably the better plan for low walls or

espaliers; cherries from twelve to fifteen; pears from twenty to thirty; and plums from fifteen to twenty; planting the spaces between each with currants, gooseberries, or raspberries, as a temporary crop to be cut away as the trees extend their branches. The same should be done between the standards, if dwarf standards. In the rows should be planted, between each tree intended permanently to remain, such sorts of fruits as will come into bearing sooner than some of the more choice kinds; such apples as the white Hawthorndean, white codlin; and such pears as the Crawford or Lammas; May-duke cherries, Orleans plums, and such like, and if required, gooseberries and currants, or raspberries.

In planting espaliers in an orchard, choice should be made of that part which is the most sheltered from cutting winds, and most exposed to the rays of the sun, as espaliers are substitutes for walls, and which they so far resemble, that trees are regularly trained upon them, and thereby fully exposed to the light and heat of the sun, consequently are less liable to be injured by winds than standards. The fruits ripened upon espaliers are supposed to be intermediate in quality, between those ripened upon walls and standards; but to obtain this effect, they should always run from east to west, and may be extended the whole length of the orchard or fruit-garden, or run in lines parallel to each other at a distance of fifteen feet, so that the shadow of the one may not fall on the surface of another. Espalier-rails are either constructed of wood or iron, and are of different forms. Those of wood are in most general use, and so far as we know, are better than iron ones. The simplest kind, and which is much used in Scotland, is merely a straight row of stakes, driven into the ground at nine or twelve inches asunder, and from four to five feet in height, and joined and kept in a straight line at top by a rail of wood, or thin plate of iron, through which a nail is driven into the centre of each stake. If the wood used be larch, from trees which are cut out of the plantations in the process of thinning, the bark scraped off, and the ends, being charred, sunk in the ground, they will last for six or eight years, and often longer, and are perhaps the best sort of espalier-rail used, as the expense is trifling, and every purpose attained that can possibly be by

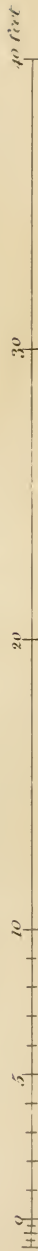
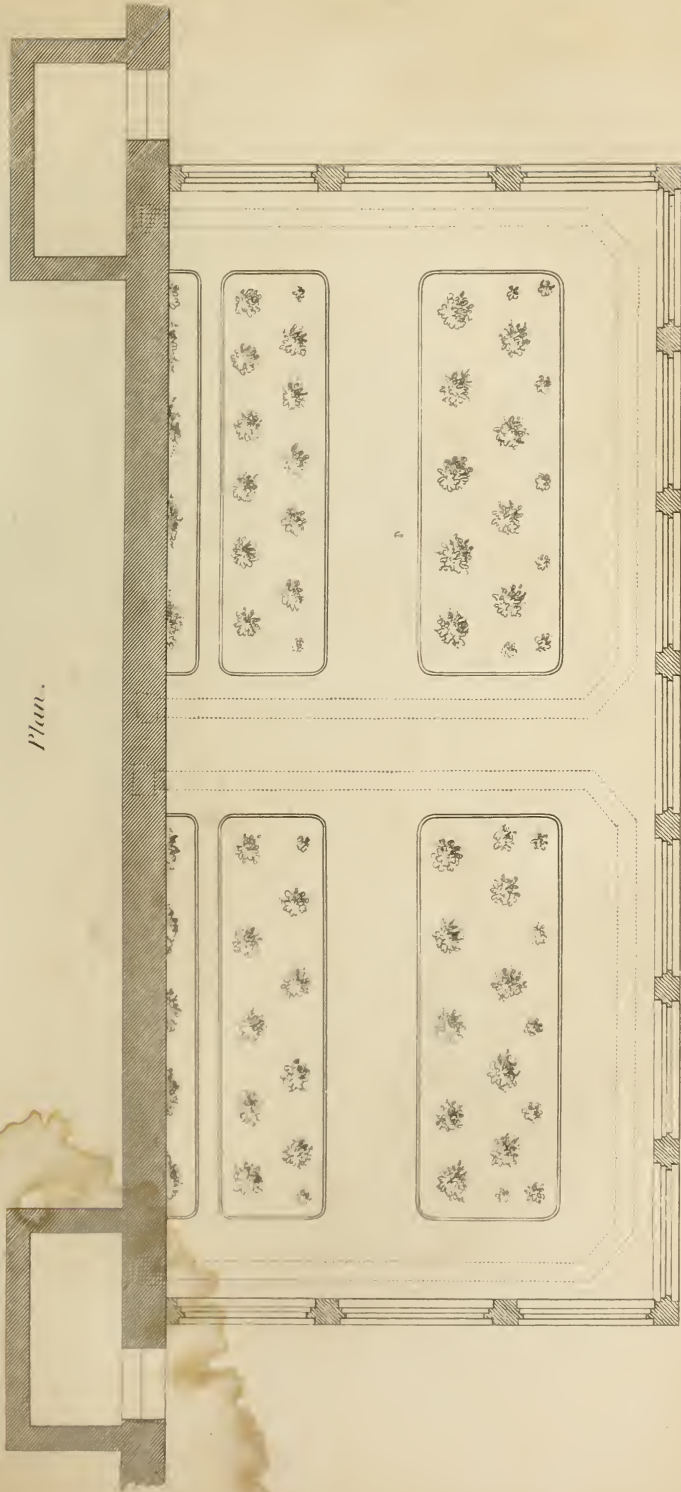
THE MARIE LOUISE PEAR

Drawn by J. T. Hart, at
M^r Lee's Hammermith.



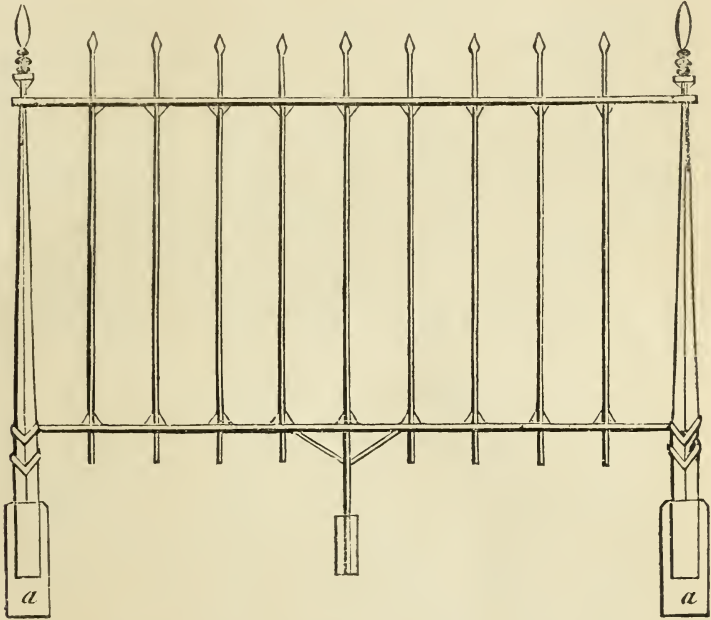
Conservatory

Plan.





such as are put up at a great expense, and will be out of repair in much the same time. Larch or other wood, with the bark left on, will last longer, but it has not so neat an appearance, as the bark after a time will come off in pieces. In a rustic or Swiss garden, we would recommend the bark being left on, as being more in character with the place.



Iron espaliers are in some places used; they resemble a common street railing. The columns or stiles may be either fixed into oaken blocks (*aa*); or, when this mode is not adopted, to form their base in the shape of a reversed **L**, setting them on a foundation of brick-work. Such rails may be erected at something more, in regard to expense, than wooden ones, but as soon as the oaken blocks, into which they are fixed, begin to decay round their outer circumference, a vacancy is thus formed between the posts and the ground, which is daily increased by the shaking of the rail by wind, or other causes, and, in consequence, the rails soon get twisted, which is increased by the expansive and contractive property of the metallic matter, and in a few years becomes very unsightly.

This is one of the causes of the principal failure in all wire fences and all metallic erections founded on wooden bases.

Espalier rails are sometimes constructed of frames fitted with vertical bars, at eight or twelve inches asunder, and should be nailed on in preference to mortising, in order to preserve the strength of the upper and lower rails. The end stiles or uprights of the frame should be set on (*not in*) stone piers, and kept upright with irons leaded into the stone. Oaken posts, or larch charred, are set into the ground instead of stones, to which the stiles of the frames are attached, and if they be wedged round at bottom with small stones, or brick-bats, they will last for some years. They are all to be painted some cheap color when put up, and this painting should be renewed once every four or five years. The best materials should be chosen for this purpose, as well as for all horticultural erections, and not any rubbish, unfit for other purposes, which we daily see done upon the principle of what is called economy.

There are many other forms of espalier rails, but all appear to possess some peculiar objection. The perpendicular is certainly the most preferable, besides having a more elegant and natural appearance. The horizontal espalier rail or table is objected to, because it constrains the trees into a form the most unnatural, and is the most unfavorable position to enjoy the rays of heat to advantage, as well as the loss of the surface of the ground under it. The oblique espalier rail is objected to, as only one side of the tree can enjoy any sun, and the other side is too much shaded, when running from east to west, and when from north to south can only enjoy half the day's sun.

Between every second or third line of fruit-trees in the fruit-garden, grass or gravel-walks should be made, for the convenience of gathering the fruits, or other necessary management, and the whole, in whatever shape it be constructed, should be surrounded with a walk of moderate breadth, separating the fruit-garden from the plantation for shelter, or other parts of the grounds. This plantation for shelter should be composed principally of fruit-trees of the more hardy kinds, such as filberts in front, and chestnuts, walnuts, &c. in the rear, intermixed with ornamental forest-trees and shrubs

CHAP. III.

SELECTING TREES FOR THE FRUIT-GARDEN AND PLANTING.

As has already been noticed, a selection of good fruits is better than a long catalogue of names, the merits of which are not properly known. Future success depends upon a good selection, and the natural situation and soil are of too much importance to be overlooked. Such sorts should be preferred as are known for their merits, either for early ripening, fine flavor, long keeping, or other properties, which may be considered as most useful to the owner. A certain portion of all, which are possessed of these properties should be planted, but a smaller proportion of the first sort. In the lists of fruits given in this work, notice will be taken of the seasons in which they ripen, and the length of time that they will keep, and from them, a proper selection should be made. According to the instructions given in the article of public orchards, care should be taken to procure the trees from some eminent fruit-grower, as being less likely to meet with disappointment. Another important consideration is to have healthy trees, free from all appearance of *canker*, *gum*, *insects*, &c.; for this purpose, where it is found convenient, the selection should be made in summer, when most of their faults are more easily detected. It is a dangerous thing to introduce a tree infected with certain diseases, particularly such as are of the infectious sorts. It not only destroys the tree itself, but probably spreads over all the garden; and as a preventive is always better than a cure, it is better to avoid planting a tree under suspicious appearances. Presuming that the ground has been properly trenched, drained, and previously ameliorated, proceed at the proper seasons, either in November, for soils of a light description, or for soils of a strong and rather damp texture, in February or March, to plant the various sorts of trees, as has been directed in a former part of the work.

In situations where, from a variety of circumstances, it may be found inconvenient or impossible to devote a separate

piece of ground for a fruit-garden, then the usual mode of introducing them into the culinary-garden must be adopted. There are many very excellent examples of fruit-trees having been introduced, either as espaliers planted along the sides of the walks, or as dwarf or half-standards, either along the sides of the walks, or in rows through the middle of the quarters. In both cases, they generally do well, for the ground having been previously made for the culinary vegetables, is generally pretty good for fruit-trees. Some give the preference to dwarf standards, some to espaliers, and others recommend a variety of stiff and unnatural forms of training, such as spiral-dwarfs, fusiform, conical, and concave or cup-shaped dwarfs. However fascinating these plans may appear, they are, like most of the French and Dutch modes of training, radically bad, and certain of defeating the object in view, namely, having fine fruit and healthy trees.

Espaliers, if well trained, either fan-formed, or which is more common, although less natural, horizontally formed, have a good effect in a kitchen-garden, and, by being planted from three to three and a half, or four feet from the walks, according to the size of the garden, will form an agreeable hedge or blind, by which the interior of the garden can be concealed. The narrow borders may be planted, according to fancy, either with flowers or strawberries; or dwarf-standards, or Buzzelars, may be planted along the sides of the walks with pretty good effect, if well kept, and produce a great quantity of fruit in most seasons. Tall standard-trees should be never admitted into a small garden, as casting too great a shade; neither should espaliers be above four or five feet high, nor dwarf-standards too thickly planted, nor be allowed to attain too great a height. From six to eight feet may be taken for the extreme height. In gardens of larger extent, the espalier-trees may be allowed from six to eight feet in height, but six feet will always have a better effect than if extended to a greater height.

CHAP. IV.

ON THE FORMATION OF BORDERS FOR FRUIT-TREES.

As the best sorts of fruit capable of coming to perfection in this climate are reserved for the walls of all gardens, and indeed the principal object in building walls round gardens is really intended for the production of fruits, which without them would not ripen in this uncertain and variable climate, and as fences of less expensive materials would answer every purpose of protection and shelter obtained from walls; the preparation of the borders next the walls should be attended to with more attention than is generally bestowed upon them. As our chief object is to produce fine fruit, we must first produce fine trees, and fine trees cannot be obtained in a soil not calculated for their growth. Where no objection exists to the expense of forming good borders, they may be made in almost all places; but where the expense is a consideration, they must be improved as far as circumstances will admit of; and where the expense is not to be incurred, nor the soil naturally good, then only such fruits as are suited to the ground should be attempted. It would be in vain to expect the finer fruits in a bad soil. Mr. Neill, an able Scotch horticulturist, observes in the Edin. Encyc. art. *Hort.* "On soils naturally very light, gravelly, and sandy, peach and nectarine trees do little good: it is better to plant figs or vines, which agree with such soils, and when trained against a wall, in a good aspect, will, in the southern parts of the island, afford excellent crops of fruit."

Peach and nectarine trees produce some of the finest fruits brought to the dessert, and the best walls of the highest cultivated gardens are reserved for their production. Next to them is the vine, but as few sorts of grapes, even in favorable seasons, ripen sufficiently well with us, any length of wall is seldom taken up with them. The fig is a tree equally tender with the vine, indeed more so, as in many situations the tree is not sufficiently hardy to resist some of our severe winters,

while the vine is seldom injured; still the fig will mature its fruit under circumstances, where the grape will not ripen. The apricot is nearly allied to the peach, and will thrive in similar situations, indeed in such as are really not so good, and it seldom refuses to ripen its fruit in our most northerly gardens. Next in importance to these fruits are some of the finest continental pears and American apples. Plums and cherries will often succeed, where neither of the above-mentioned fruits will thrive. In preparing borders for those trees, we will consider them in the following routine: the peach, nectarine, and apricot. The two former are so nearly allied to each other, that it has been supposed by many, that they have sprung from one common origin, and therefore are only varieties of the same species. Linnæus considered them as one species, differing only in the one having downy fruit, and the other smooth. There are many instances on record of both peaches and nectarines growing on the same tree, and sometimes on the same branch. One instance is recorded in the Horticultural Transactions, of one single fruit partaking of the nature of both. The French consider them as one fruit, arranging them in four divisions, downy peaches with free stones, and downy peaches with cling stones; smooth peaches, or our nectarines, with free stones, and smooth peaches with cling stones; and many botanists consider the peach and almond as one species.

In preparing the borders for peach, apricot, and nectarine trees, the first consideration is to render the bottom perfectly dry by draining; indeed, this precaution ought to be taken to a certain degree, even where the bottom is perfectly dry, in order to guard against accidental floods of water, or a long series of wet weather in autumn, as their roots are very impatient of too much wet. Where the borders are to be well done, the natural soil should be entirely taken out to the depth under the ground-level of the wall, of thirty inches or three feet; the bottom should be rendered smooth, with a considerable fall from the wall to the walk sufficient to allow any water that may collect to run freely off towards the walk, under which should be a well-formed drain of the best materials the nature of the place can afford. Stones or flints are to be preferred, when they can be got; brick-bats are the next best for

this purpose, or pieces of chalk which have not been exposed to the weather. Where neither of these is to be got, fagot-wood is to be used. Let this drain have a sufficient fall to carry the water either clear off to the outside of the garden, or else to some main drain, where it will be carried off with the other superfluous water, collected in the garden. Upon the bottom of the border thus prepared, lay some well wrought clay, which should be spread equally over the whole, three or four inches thick, sprinkling a little good lime amongst it; over this lay two or three inches of finely sifted coal-ashes, and let the whole be well incorporated by treading, and after partly dried, well rolled, until the whole form a compact solid floor. This operation should be carried on in dry weather, to admit of its drying quickly. This will form a compact floor, such as many barn and cottage-floors are composed of, and will not be readily penetrated by any roots that the trees may send down. The compost, which should have been preparing for some months previously, by being turned over and exposed to the air, should then be brought forward, and thrown into the border; if the soil that was taken out, were naturally good, and of a loamy nature, a portion of it may be again returned into the border, and well mixed with the new earth, and the border filled up a foot or fifteen inches above the intended level to allow for sinking. This should be all done through the summer, previous to planting the trees. The soil prepared for this border should be such as is often met with upon old sheep-downs, and of that sort generally known by the appellation of light rich loam, of a hazel color, and friable texture, crumbling to pieces in the hand, by rubbing, and containing a large portion of fibrous matter, or the rotted roots of plants. Such soil as this is anxiously sought for by the nurserymen for their green-house plants, and if good, is the best soil we have ever found for peaches, and will be sufficiently calculated to grow fine healthy trees without any compound whatever. If manure is to be added, from a supposition that the virgin loam is not rich enough, prefer that of decomposed vegetable matter, such as is generally called vegetable mould. Avoid, if possible, the addition of dung for those trees, as it only excites them to grow luxuriantly, and

to imbibe nourishment too strong for their constitution, and ultimately bring on a train of diseases, arising, if we may so call it, from a too full habit. *Gums, cankers*, and other well-known diseases, derive their origin more from gross feeding than from any other cause, if we except accidental wounds.

When the mould is first brought from the downs, choose the top spit only, unless the depth of loam be uncommonly good; the surface is, however, the best, taking care to have all the turf or vegetable matter taken also, which, by undergoing decomposition in the process of turning, and amelioration, will greatly enrich the whole. If such earth cannot be got, which is often the case, search must be made for the best that can be found, and if too light, add a portion of stronger loam, or scourings of stagnant ditches which have been for some time exposed to the air to sweeten; blend the whole together, and if not sufficiently strong, add a portion of good garden-mould to it; but the more simple the preparation, the better will it be. If the mould be too strong, add a sufficient quantity of road scrapings, very rotten vegetable mould, with a small proportion of sand, which contains the least iron that can be got. If at any time, or in any case, in forming or renewing borders for peach-trees, the composition collected is not rich enough, which will seldom be the case, unless in a very poor soil indeed, and dung must be added, prefer the dung of cows or hogs to that of horses, as being of a more cooling nature, but in all cases, it should be rotten to a complete mould. Turf collected by the sides of roads, and loamy ditches cut up and well rotted, form of themselves a good soil for peaches.

Where this mode may be considered too expensive, let the borders be trenched over to the depth of at least three feet; and, in the process of trenching, remove from it all gravelly or clayey soil, both of which are hurtful to peach-trees, and in proportion to the quantity removed, substitute a like proportion of good loam, such as is described above. The better the borders are prepared in the first formation, the less trouble will they be in future, and instead of disappointment arising from want of fruit, and dead trees, the quantity of fruit, and health of the trees, will be in proportion to the care taken in

the formation of the border, supposing all other circumstances to combine in their favor.

Vines will succeed in a soil that has a gravelly or dry bottom, and in other respects neither too rich, nor too strong, although vines will grow more luxuriantly, and produce larger fruit, in soils of a richer description, and for this reason, we are at much pains in preparing vine borders for such vines as are to be forced or grown in a vinery; yet, for such as are to be cultivated on the open walls or espaliers, we are convinced, from experience, that rather poor, or at all events light soils, are preferable. "The greater part of the vineyards of France, says an intelligent horticulturist, are on a soil (*argil-calcareous*), sometimes *primitive*, as those near Dijon: and sometimes *secondary*, as those at Bourdeaux. *Argillaceous gravel* is the next in frequency, as near Nismes and Montpellier, and that which produces the *Vin des Graves* of Bourdeaux. The excellent wines of Anjou are made from vines growing among *schistous* rocks. Wines, such as are made from vines planted in chalky soils, are weak, colorless, and do not keep so well as those of Champagné. Vines grown on the ashes discharged from volcanoes are excellent, as those of Vesuvius and Etna. Retentive clays are the worst soils for vines, the flowers are in a great part abortive; the fruit, if it sets, does not ripen; the shoots not ripening well are more easily affected by frosts; and the wine, if any can be made, is weak and worthless."

We have many instances of vines growing out of old walls, among lime-rubbish, and in almost pure gravel, producing excellent crops, and ripening their fruit, while others growing in rich soil, although much more luxuriant, and equally fruitful, do not ripen at all. This is, probably, carrying the merits of a poor soil to the extreme; it proves however, to us, that the drier and lighter the soil is for vines on the open walls, the more likely are they to ripen their fruit, and this is the chief object to be aimed at. Therefore, in preparing any part of a border for vines, a light soil upon a perfectly dry bottom is necessary to their ultimate success.

Figs will succeed in any tolerably light garden-mould, where the bottom is not wet. In preparing any part of a border for

them, if the bottom be perfectly dry, or rendered so, any light loamy garden-soil will be sufficient. The principal failure of figs in this country arises from not choosing a proper situation for them, as far as regards the aspect, the best in the garden should be allotted to them and vines.

Pears.—A dry deep loam is the best soil for the pear-tree, when upon a stock of its own species, but on a quince stock, it requires a soil rather moister; however the bottom of the border should be dry. A gravelly bottom is good, provided there be sufficient depth of mould over it. A clayey, wet, spongy bottom is the worst of all, and should be guarded against by draining, and the bottom of the border secured by a floor, similar to that recommended for peaches and nectarines, or else a floor formed of pavement, or other durable materials, to prevent the roots, which are apt in this tree to penetrate to a great depth, from getting into a bad sub-soil. The border should be made good to the depth of three or three and a half feet, and composed of good hazelly loam from an old pasture, previously prepared, as already described for peach-trees. If the loam be not rich of itself, it should be assisted by the addition of a portion of well rotted dung, such as has been used in cucumber or melon-beds, and mixed well with the loam in the compost-yard. The pear is, generally, a hardy tree, much more so than the apple, and will prosper in soils where apples will not live. Pears require a soil much stronger and deeper than any other of our cultivated fruit-trees.

Apples.—In preparing borders for apples, if the soil be tolerably good, and the sub-soil perfectly dry, little else is required, but if the soil be not naturally good, it must be improved by removing the bad, and substituting better mould. In soils extremely sandy, gravelly, or clayey, apple-trees will thrive but little, and in wet ones, they soon canker and die. One-third or one-fourth of virgin loam of middling texture, with a small addition of very rotten dung, will improve soils of a very bad nature sufficiently for the production of good apple-trees.

Cherry.—The cherry delights in a dry, light, and rather sandy soil, but not gravelly, in which latter soil it soon pe-

rishes. Any good garden-soil is fit for the cherry, and if the soil be not of itself good, it may be rendered sufficiently so by the addition of one-third or one-fourth of fresh light loam, such as has been already recommended for the apples. Some sorts, as the May-duke, will thrive in any ordinary garden-soil, and on almost any aspect with equal success.

Plums.—Plums are found to flourish best in a soil neither too light nor yet too heavy and wet; in either extreme they seldom do well. Borders for plums, if not naturally good, may be rendered so by making the bottom perfectly dry, by draining, and making the borders to consist of one half light fresh loam, and one half garden-mould, vegetable mould, and road-scrapings mixed together, and prepared some time before using. In soils not congenial to them, they are apt to gum and canker, in which case they should be cut down and the mould entirely cleared away from their roots, and the fresh compost, already recommended, given them.

CHAP. V.

ON THE PROPER ARRANGEMENT AND ASPECTS FOR FRUIT-TREES UPON WALLS, AND THE DISTANCE AT WHICH THEY SHOULD BE PLANTED.

IN gardens where forcing-houses occupy the principal or south aspect, it is seldom that much room is left for a great variety of the sorts of finer fruits, unless the garden be extensive enough, and so arranged, by the disposal of the walls, to have more than one principal wall having a south aspect. In such cases, where there is a proper proportion of walls of all aspects, we would recommend dividing each into as many divisions as it is wished to have sorts of fruits cultivated, arranging the divisions in proportion to the quantity of each sort of fruit and aspect. An arrangement of this sort we consider

of more importance than appears in general to have been attached to it. The principal reasons, in support of such arrangement is, the facility with which borders may be prepared for different species of fruits; thus, fifty or a hundred yards of border for the more delicate trees, such as peaches, nectarines, &c., may be prepared entirely for them, whereas, if they be promiscuously planted among the other trees, the preparation of the border could not be so well accomplished. The advantage of protecting them occasionally, of watering, &c. will be great, independently of the effect which it will produce when the trees are established, and each occupies its respective share of the wall, thereby giving a regularity and order to the whole. The merits of the sorts can be better ascertained by comparison, when growing contiguously, than if grown at a distance from each other.

A south or principal aspect should be occupied with vines, figs, peaches, nectarines, the finer sorts of pears, and a few cherries, plums, and apricots. The vines and figs must occupy such a portion of the wall, according to the circumstances of the situation, such as the probability of their ripening, &c.; and the portion appropriated to figs must be regulated by the taste of the proprietor. Unless in very favorable situations, and where the proprietor esteems the fruit of the fig, the smallest proportion of the wall should be occupied by them. Or the vines may be planted at convenient distances, and trained to the top of the wall with a naked stem, and then trained horizontally along under the coping. In this way they will not occupy much space, nor interfere, at least for some years, with the other trees. If trained in this manner, they may be planted at thirty or forty feet apart; but if planted to fill up a regular space of wall, which for many reasons is to be preferred, they may be planted at the distance of four to six feet apart, according to the height of the wall. For high walls, and weak growing vines, they may be planted at three feet apart; but for strong growing sorts, and walls of less than the ordinary height, they must be planted at a greater distance from each other. The largest proportion should be planted with peaches and nectarines, at a distance of from twelve to fifteen feet apart, that is, the trees which are in-

tended to remain permanently, and between them should be planted *riders* of the same sorts of fruits, in order the sooner to fill the wall. This is to be understood for walls of more than ten feet in height; but for walls of a less height, it is not worth while, as gooseberries, currants, or raspberries, will answer better, and produce fruit sooner; but, as the permanent trees, which should always be dwarfs, fill up, the *riders* or other substitutes should be cut away by degrees, to make room for them. The next division should consist of the finer sorts of pears, which should be planted dwarfs, and at from twenty-four to thirty feet apart, according to the mode of training intended to be adopted, whether fan-formed or horizontally; the latter mode requires the greater distance, but the former being the most natural, and unquestionably the most elegant, is now generally adopted; between them may be planted *riders* of cherries, plums, or peaches and nectarines. As the finer sorts of pears attain a considerable size and age, even under the best management, before they produce fruit, a considerable advantage will be gained by planting such trees as will fruit soon, and be in their turn cut out as the pears advance. The next division will be the choicest sorts of apples, and they should be planted at from eighteen to twenty feet apart, and the intermediate spaces also filled up with such trees as will produce fruit soonest, and be also cut out as the apples advance. Apricots should occupy a smaller proportion, as they will, in good situations, arrive at great maturity, having either an eastern or western aspect. One or two trees will, in a good situation, be sufficient for a south wall, and those merely to come in a few days sooner than those on the other aspects. Plums and cherries should also, in favorable situations, occupy only a small proportion of south wall, as they will do equally well on other aspects; a tree or two of each may be planted for the same purpose as the apricot, or they may be introduced in the spaces between the other permanent trees, to be cut out as will be found necessary. The Morella cherry is much improved by being planted on a south aspect; one of them may be planted, and also a May-duke, as the latter, being an early fruit, will be a great acquisition to the dessert before the other fruits ripen.

Eastern aspects are considered by some as next in importance to the south, whilst others give the preference to the west. If both be equally sheltered, the preference, if any, should be given to the east, as enjoying the rays of heat sooner in the day; but if not partially shaded, so as to allow the frost to be gradually removed in the spring months, before the rays of the sun strike upon the trees, the preference should then be given to the west. The sudden transition of heat darting on the trees by the morning sun, after the cold frosts of the preceding night, is the cause of so many failures of our earlier fruits in this uncertain climate. As both aspects are so nearly alike, they may be considered under the same head.

The arrangements advised for the south aspect, as to forming the border into divisions for each species of fruit intended to be planted, should also be attended to in this instance. The proportions, however, must be different. Vines should be planted only in very favorable situations on eastern or western aspects; but, provided that they have been accommodated with room on the south, it may be better not to plant any. Figs will thrive on either of these aspects under favorable circumstances; however, if they have been planted on a south wall, only a few trees of them need be planted on any other, and that merely for prolonging their season.

Peaches, nectarines, and apricots, should occupy a considerable portion on both, as by a judicious arrangement of sorts their season will be considerably lengthened. Both early and late sorts should be planted on each; if the latter sorts should in some seasons not sufficiently ripen, the loss will be trifling, as the advantage of them in October, in propitious seasons, will amply compensate for the loss of a crop in less favorable ones. Care however must be taken not to plant many late sorts on eastern or western aspects, particularly in cold situations, for if the wood should not ripen, the trees would be materially injured. But with a little precaution in covering them, in wet and backward autumns, with temporary frames and lights, they will be found, in most seasons, to ripen both wood and fruit.

The secondary sorts of fine pears and apples, as well as many of the finest, will ripen well on these aspects, and they

should occupy the largest proportion of wall, that is, bearing the same proportion as peaches and nectarines on the south.

Cherries and plums should here occupy a space, particularly the finest plums, and both will come in intermediately between those of the south aspect and those on standards.

A northern aspect is the least favorable for most fruits requiring the aid of walls to bring them to perfection; however, for many sorts of cherries, plums, and some pears, it is admirably suited, as well as for late crops of currants, gooseberries, and raspberries, to be protected by nets; the two former lasting till destroyed by the frost, and the raspberries as long as the nature of their fruit will admit of. Morella cherries can, by being protected by nets, be preserved on a north wall till the end of November in favorable seasons, and, with the addition of red and white currants, will be extremely useful, both for culinary purposes and the dessert, when all other small fruits are out of season. - Upon a northern wall, the largest portion should be planted with cherries, particularly Morellas, and all vacant spaces should be filled with red and white currants, if a separate wall cannot be allotted for the latter by themselves, which they amply deserve.

Many sorts of plums ripen well upon northern walls, particularly in the southern counties, as well as some valuable pears, and many apples. The same arrangement should be attended to in keeping each species by themselves.

In regard to the distance that wall trees should be planted, many circumstances are to be considered, such as the height of the walls, the kind of tree, and mode of training intended to be adopted. For walls, twelve feet high (the medium height) the late W. Nicol recommended for apples, eighteen or twenty feet; apricots, twenty or twenty-four; cherries, twelve or fifteen; figs, fifteen or eighteen; pears, twenty-four or thirty; peaches and nectarines, twelve or fifteen; and plums, eighteen or twenty. For walls not exceeding five or six feet in height, he recommends for apples, thirty feet; cherries, thirty or thirty-five; plums, twenty or twenty-four; and pears, thirty or thirty-five.

Abercrombie, upon the same subject remarks, that upon walls of the above-mentioned heights, vines should be planted at

from ten to fifteen feet apart; peaches and nectarines from fifteen to twenty; figs, eighteen to twenty (or more, as the bearing branches are not to be shortened); apricots, fifteen feet for the early sorts, and eighteen to twenty-four for the latter, and freely growing kinds; cherries, from fifteen to twenty; pears, from twenty to twenty-four; apples, on dwarf stocks, fifteen feet, and if on free stocks, thirty feet; plums, fifteen to thirty-five; mulberries, fifteen to twenty. Upon walls, he adds, of only nine feet in height, the distance from each tree should be increased to one-fourth; and upon those only six feet high, the distance should be increased one-half.

The above arrangement of the wall-fruit-trees refers to walls that are not *hot walls*; upon such, the arrangement may be somewhat different, and upon them many fruits may with propriety be planted, that would not succeed in ordinary situations, upon solid walls, that is, walls not heated by artificial means. The general prejudice against hot walls is, we hope, now likely to be exploded, for if they be heated by hot water, as already noticed, they will give a temperature more equable, the want of which has hitherto been their greatest defect, one part of the wall being over-heated, while another was scarcely heated at all. In gardens, where the principal walls, having a southern aspect, may be covered with glass, peaches and other of the finer fruits may be successfully cultivated upon eastern and western aspects, having the walls hollow and heated by hot water, both sides of the wall deriving an equal degree of heat, and that from the same consumption of fuel.

In situations where, from unfavorable circumstances, the trees may be expected to be short-lived, they should be planted much nearer to each other; as, in some situations, the trees would be worn out before they could be brought to cover so great a space as has been allotted to them in the foregoing remarks.

MONTHLY OPERATIONS

OF THE

FRUIT GARDEN.

JANUARY.

PRUNING FRUIT-TREES.

The art of pruning chiefly consists in being acquainted with the nature of bearing in the different sorts of trees, and in forming an early judgment of their habits and manner of producing their shoots and branches, as well as other circumstances, for which some rules may be given; but there are particular instances, of which it is impossible to decide but on the spot, and which depend chiefly on practice and observation. No rules can be laid down that are equally applicable to all trees or all situations. The objects of pruning are various, such as promoting growth and bulk; the renewal of decayed plants and trees; modifying the form; enlarging the fruit; promoting the formation of fruit-buds; lessening the bulk of the trees; adjusting the branches to the roots; and the removal or cure of diseases, &c.

PRUNING STANDARD FRUIT-TREES.

Standard fruit-trees are seldom much pruned after they have attained a bearing state, except to regulate any irregularity in their branches, although no doubt can exist, that they would, in most cases, be much benefited by a more regular use of the knife. Upon this subject, Knight justly recommends, that the points of the extreme branches should be every where kept thin and pervious to the light, so that the internal parts of the tree may not be entirely shaded by the external. The light should penetrate freely into every part of the tree, and if

this be judiciously attended to, every part of it will be equally productive of fruit, and the trees thus treated will not only produce a greater quantity of fruit, but the fruit itself will be much better in quality, having the full benefit of the sun, which in crowded trees is not the case. The trees will also be able to bear a greater load, without running the risk of breaking down.

Thinning the branches of old trees, and keeping them supplied with fruitful wood, encouraging young shoots to take the place of those that are getting into decay, and keeping them moderately thin, are points which ought to be strictly attended to. All formality, however, in their heads should be disregarded, as being both injurious and incongruous. No tree looks so well as one which spreads out its branches as nature directs; and all look ill which are clipped and shorn into conical shapes, such as balloons, cones, pyramids, &c. It is long since that these fantastical forms have been justly expelled from our ornamental trees, and it is with regret that we hear them recommended for our fruit-trees. The nearer our modes of training approach to nature, the more likely are we to have healthy and fruitful trees.

PRUNING AND TRAINING APPLES AND PEARS ON WALLS AND ESPALIERS.

These two trees being similar in their manner of bearing, that is, that both of them produce their fruit on spurs, which issue chiefly from the sides, though sometimes, from the ends of their branches, one mode of training and pruning will answer for both. When the espalier or wall on which they are planted is not more than six feet in height, then horizontal training is best; but when the walls are of greater height, then the fan method is preferable, and is the only mode of training pointed out to us by nature. Indeed, these two methods of training all fruit-trees, excepting the vine, (and that also, in some cases, may be very properly trained in the same manner,) seems from experience to convince us of the inutility of any other mode. The different modes of training recommended of late years produce extremely unhandsome trees,

and we have not been able to discover any great advantage gained, either in the quantity or quality of the fruit, nor in the health of the trees. For low walls we give the preference to the first of these methods, and always for espaliers; and on a



high wall, no mode, we think, looks so elegant as that of a tree fan-trained. Apples and pears may be either trained fan-like, or horizontally, according to circumstances and taste. By training in the fan-manner a branch may, at any time, be supplied more readily than in the other, for which reason, it is preferable for Morella cherries, peaches, nectarines, plums, and apricots. The distance at which the principal branches should be laid in, is from nine to twelve inches, according to the nature and strength of the tree; some sorts growing more grossly than others, both in wood and leaves. Trees that have arrived at a full bearing state, and have filled the spaces allotted to them, require nothing else, in respect to pruning, than to regulate their spurs, if much clustered, and to prune away the superfluous breast-wood made in summer. The usual practice, however, till of late years, has been to leave these spurs standing out from the walls for a great distance, and so thick that the tree in the end becomes like a hedge more than a cultivated fruit-tree. The spurs thus standing out so far from the wall, benefit very little from the rays of heat reflected from the wall, and are as much exposed to the effect of frosts, and cutting winds, as if they were actually growing on standards, independently of which, the fruit produced is of a very inferior quality. At this season, examine all the apple and pear-trees, both on espaliers and walls, and

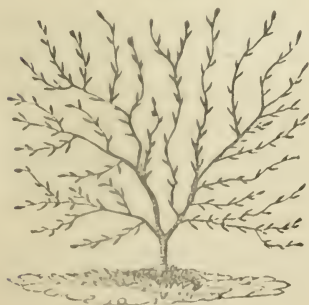
thin out and regulate all their spurs. Wherever large rugged projecting spurs occur, cut them clean out, close into the branch; and at the same time, be careful to preserve a sufficient number of the healthy fruit-spurs emitted from the branches. Cut out all decaying, cankered, and dead wood, or barren stumps, which will not only give the trees a neater appearance, but will also much improve their health, by allowing a free circulation of air and sunshine to every part of the tree, and by displacing all useless ill-placed spurs, disencumber the tree of a great load of entirely useless leaves and small spray, which it would otherwise have to support, and which, to a serious degree, would rob the fruit of a great share of its nourishment. Apples often show fruit-buds at the bottom of the breast-shoots shortened in summer, in which case, if the tree be thin of fruit-spurs, they are to be retained, the better to ensure a crop. Some sorts of pears show buds of this description, particularly in good seasons; under similar circumstances, they ought to be allowed to remain; but if there be plenty of fruit-spurs without them, they should be cut out, to prevent an unnecessary quantity of useless breast-wood being produced the ensuing summer. Trees that have not filled their respective places, and are consequently under a mode of training for forming their several ramifications, must, where the wall requires to be covered, have their nearest or last-formed branches shortened, in order to cause them to push out others to fill the wall. This shortening must be in proportion to the strength of the shoots; strong ones may be shortened one-third of their length, weak ones one-half, or two-thirds, and very weak ones may be shortened into two or three buds. This will cause them to break strongly, and to produce proper shoots with which to form the tree.

In training horizontally, the side branches, unless in cases of accident arising from bruises or other causes, should never be shortened until the tree has filled the space allotted to it. The upright, or leading shoot which forms the trunk, or main stem of the tree, should at this time, or in March, be shortened, in order to cause it to push out lateral branches. This shoot must be shortened also, according to its strength; if it be weak, it will only be able to push out two lateral branches,

consequently it should be shortened to about nine or ten inches; if it be, however, strong, it will in all probability push out four laterals, two on each side; in that case, cut it to double the length of the last. This mode of training is consequently longer in filling the wall than that of the fan-manner. In cases, where the soil is very good, and the trees in a very vigorous habit, they will probably, in some cases, push more than four lateral shoots in one year; if this be apprehended from their appearance, lay the leader in at a greater length, and allow a greater number of laterals to be laid in on each side.

It appears to have been the object of cultivators, in devising a number of forms of training, to attain some degree of control over the circulation of the sap, for the purpose of inducing a greater degree of productiveness; but how far they have attained the end in view, does not clearly appear; it is, nevertheless, evident, that in proportion as they have diverged from the above forms, they have produced deformed and ugly trees. To train fruit-bearing trees, the principal use of which is the production of fine fruit, into unnatural and uncouth forms, merely for fancy's sake, appears as preposterous as it is useless.

To enter into a detail of all the forms recommended would be useless, and far exceed our limits. We give the following, as specimens of the sub-varieties of the two leading modes, which may be considered the fan and the horizontal. No. 1, the irregular fan; No. 2, the stellate fan;

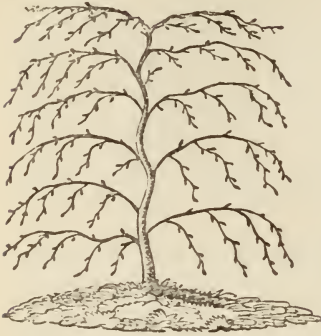


No. 1.



No. 2.

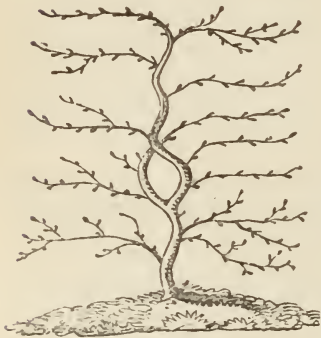
No. 3, the drooping fan; No. 4, the wavy fan; No. 5, the horizontal, with screw stem; No. 6, the horizontal, with double stem.



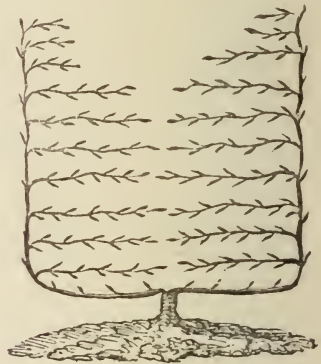
No. 3.



No. 4.



No. 5.



No. 6.

The first five modes of training here represented, are applicable to cherries, plums, and some other fruits, with slight modifications, as well as to apples and pears; and trees trained in either of these ways, other circumstances being favorable, produce abundant crops of fruit, and, by adopting a system of judicious pruning, may be long kept in a healthy and bearing state.

In training the apple and pear, some have recommended the vertical mode of training, and this method very often occurs in the gardens of Scotland. Of this method there are two va-

rieties, the vertical, with screw or wavy shoots, No. 1; and the vertical, with double stem, or upright shoots, No. 2.



No. 1.

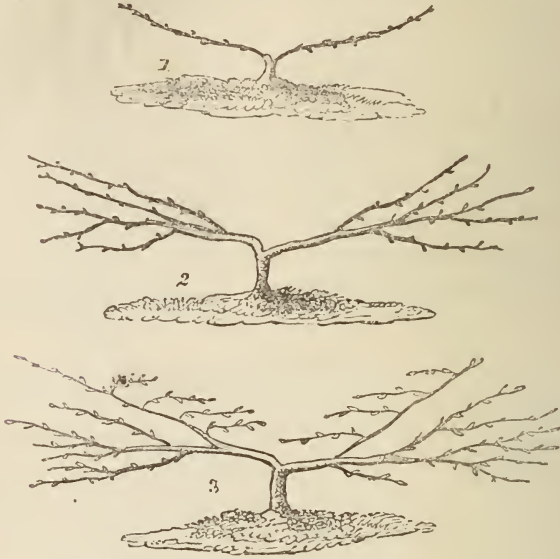


No. 2.

These two last modes of training are sometimes adopted with pears and apples, and commences the same season that the trees are planted, by leading one shoot horizontally from each side of the stem, within a foot or fifteen inches of the ground-surface, and the shoots which proceed from them are trained upright till they reach the top of the wall, and are sometimes trained straight, as in No. 2, and often in a serpentine form, as in No. 1. These are favorite forms of training with Dutch and Flemish gardeners, and appear to have been long practised by them. They are, with us, for the most part applied to the training of currants upon walls, and not unfrequently to vines grown in the open air. Whatever merits they may be supposed to have, in regard to producing fruitfulness in the trees, we confess that they, together with No. 6, appear to be less elegant, as they are the farthest removed from the natural habit of the trees.

Mr. Knight, amongst others, has recommended, with all that zeal and ability for which that horticulturist is so eminently distinguished, a mode of training, which he denominates the open fan form, and which he proposes should commence while the trees are in the nursery, and he considers its application as referring to almost all fruit-trees. This open fan mode of the President's does not materially differ from that described by that eminent French horticulturist, the late Pro-

fessor Thouin. During the first and second years of training, it differs little from many other modes which have been long in practice, *Figs. 1 and 2*; but the third year it becomes characteristic, by reversing the lateral shoots, *Fig. 3*.



In pruning at this season, as well as at all others, it is of importance to keep a strict eye on the lower parts of the trees, whether they be young trees training, or old and fully established ones, in order to see if there be any existing vacancy, or any probability of such soon happening. In which cases, if any good shoot be situated contiguously, it should be trained in either at full length, or shortened to a few eyes to force out as many shoots as may seem necessary; for due precaution should ever be observed in taking care to have a sufficient stock of young wood coming forward to fill up any vacancy that may occur, and for substituting a new set of branches for such as are either decayed or stand in need of retrenchment. As the operation of pruning goes on, it is necessary to have the branches again, as soon as possible, re-nailed or tied to the wall or espalier, taking particular care to train them in with great regularity. If horizontally, lay them in parallel to each other, at equal distances throughout; and if fan-trained,

lay them in straight, allowing them greater space as they extend to the extremity of the trees, laying in the principal branches first, and the smaller ones regularly between them, avoiding crossing any of them, and observing to make the opposite branches on each side range equally in the same manner and position.

PRUNING PEACHES AND NECTARINES.

If the weather be mild, and the wood of these trees has been well ripened during the previous autumn, they may now be pruned; but in most cases, we would recommend February and early in March, when all danger of frost is past. This is of the greatest consequence in cold wet soils, and consequently in late situations. At all events, whether the pruning be now carried into effect at this time, or not, if the trees have not been disengaged from the walls in December, they should now be done, that is, by unnauling them, and securing the larger branches only to the wall, to prevent accidents from snow or strong winds; or a few stout poles may be placed between the trees and the walls, to which some laths or cords may be attached, for the purpose of having some of the leading shoots of the trees affixed to them. This will prevent their being broken by accidents, and admit of more readily getting at the branches, when the pruning goes on; besides, if kept in this position till the end of February, or later, it will greatly retard the buds from swelling, and consequently give them a chance of escaping the severe frosts in spring during the time they are in blossom.

As to the mode of training, we perfectly agree with Nicol, that they should be trained in the fan manner, and no other. It is not practicable to train them to any considerable extent horizontally, as they produce their fruit on the wood of last year; and because these often require to be shortened, and the older branches cut entirely away, in order to obtain a supply of young bearing wood. These trees may be said to be always in training, as there must be a constant cutting out of the old and encouraging of the young wood in every part of the tree, even after it has filled the full place allotted to it. The distance that the old or leading branches may be placed

from each other is not important; they may be sometimes pretty close and at others more distant, but this must be regulated by the quantity and position of the young wood that may be upon them. These, in healthy and well-regulated trees, should be laid in at the distance of from six to nine inches apart from each other. It is the regular management of the young shoots, more than of the old ones, that produce health and beauty in a peach or nectarine-tree, and by having a regular supply of young wood in all parts of the tree, a regular crop of fruit will follow. To produce this regular supply of young wood, it is necessary to have recourse to shortening the branches of the preceding year, more or less, according to their size, the state of the tree, and other circumstances. All those which are hurt by frost, and not sufficiently ripened to their extremities, or bruised by accident, cankered or mildewed, should be shortened; and also all those from which it is wished to procure a supply of other shoots, either to fill a vacancy, or for the extension of the tree. The lengths to which they should be shortened, depend also on a variety of circumstances, such as their strength or debility; the more strong and luxuriant may be shortened to one-third of their length, and sometimes, when very strong, and the border in good state, to be shortened only a little. In all cases, where shortening is necessary, care must be taken to cut them at a wood-bud, and not at a flower-bud, which may be distinguished in late pruning more readily than in early or autumn pruning, by the flower-buds being always bold, round, short, and turgid, while the others are rather long and flattish, and generally terminating in a sharp point. It very frequently happens that a wood-bud is placed between two flower-buds, particularly on strong growing healthy trees; and where this is the case, shortening may be safely performed at such buds, observing to cut at a little distance above them, for fear of injuring either of the buds, but particularly the wood-bud.

The principle of shortening these trees is to keep a supply of such shoots as are to produce future crops, and fill the space allotted to each tree. While trees are young, this shortening of their extreme shoots is of the utmost consequence, particularly towards the bottom and middle of the tree; for if

they were laid in at full length, the bottom and heart of the tree would thereby become thin, and indeed naked of such shoots; and the nature of most stone-fruits is such, that amputations of large branches are dangerous, producing gum, canker, and finally death. But this is more particularly the case with peaches and nectarines; therefore a supply of young wood should be encouraged, and is easily obtained at the bottom and in the middle of the trees, by attending to shorten the greater part of the shoots, and retaining the young ones thus produced, in such proportion as may be deemed necessary for keeping up the supply. At the more extreme parts of the trees, this shortening is less important, particularly in old trees, or such as have filled their allotted space of the wall; but where such have been injured by frost, mildew, or other accidents, they should be always cut back, until the wood appears quite sound and perfect. Where this is not the case, it will be readily seen by the color of the wood, which will appear brown, or cankered to the pith. Sometimes this appearance will run back to where the branch issues from the leader; in such case, remove it entirely, as there is little chance of a healthy supply of shoots being produced from such a diseased branch; but in cases where the entire removal of such a branch will deform the tree, and no branch can be brought in to succeed, without crossing some of the larger branches, then, one or two wood-buds may be left at the base of the shoot; if they break strong, and the tree be otherwise in good health, there will be a chance of providing a shoot or two, that, with proper care, may fill up the space required. In trees of gross habits, that is, such as are growing too luxuriantly, the knife should be used with care, as the more they are cut, the more will they be encouraged to grow. In such cases, shorten only the tips of the branches, and lay in as much wood as can conveniently be done; this will soon correct the gross habit of growth, and throw them into a fruit-bearing state.

All trees naturally grow strongest at their extremities, whether they be young or old; it therefore follows, that we should exercise the knife less freely there, and more freely in the lower and middle parts, in order to counteract this propensity,

and to obtain a regular supply of bearing wood. Where a tree abounds with middling-sized well-ripened shoots, having a bold wood-bud at their point, as it often happens on such, that there will be a wood-bud at the point, and only one or two at the base of the shoot, the intermediate ones being all flower-buds, then, in this case, they should be laid in at full length. To cut in the middle of such shoots would be useless, as no bud would push, except that at the bottom; and although the fruit-buds might blossom, and even set their fruit, they will ultimately all fall off for want of a leading shoot to draw nourishment for their support. In this pruning, clear the tree of all redundant, irregular, and improper shoots, remove or reduce some part of the former bearers of the preceding years, cutting the most naked quite away, and others down to the most eligible younger branch, or well-placed shoot; but this should be done carefully, not to cut too much out at once, but to cut a portion annually. Also all dead or diseased shoots should be cleared away. Peaches will sometimes produce fruit upon spurs; and in cold late situations, Mr. Knight has recommended the adoption of them to a certain latitude. "Instead," he says, "of taking off so large a portion of young shoots, and training in a few only to a considerable length, as is usually done, and as I should myself do, to a great extent, in the vicinity of London, and in every favorable situation, I preserve a large number of the young shoots, which are emitted in a proper direction in early spring by the yearling wood, shortening each, where necessary, by pinching off the minute succulent points, generally to the length of one or two inches. Spurs, which lie close to the wall, are thus made, upon which numerous blossom-buds form very early in the ensuing summer, and upon which, after the last most unfavorable season, and in a situation so high and cold that the peach-trees, in the most favorable seasons, had usually produced only a few feeble blossoms, I observed as strong and vigorous blossoms in the present spring, as I have usually seen in the best seasons and situations; and I am quite confident, that if the peach-trees in the gardens round the metropolis, had been pruned in the manner above described in the last season, an abundant and vigorous blossom would have appeared in the present

spring. I do not, however, mean to recommend to the gardener to trust wholly, in any situation, for his crop of fruit to the spurs produced by the above mode of pruning and training the peach-tree. In every warm and favorable situation, I would advise him to train the larger part of his young wood according to the ordinary method: and in cold and late situations only, to adopt, to a great extent, the mode of management above suggested. A mixture of both modes, in every situation, will be generally found to multiply the chances of success, and therefore neither ought to be exclusively adopted or wholly rejected in any situation. The spurs must not be shortened in winter or spring, till it can be ascertained what parts of them are provided with leaf-buds."

In situations where the earliest sorts of peaches and nectarines will not ripen, without adopting this or any other method of pruning to produce spurs, we would recommend only a small portion of wall to be taken up with them, as the finer sorts of pears and other fruits that will ripen, will repay the owner much better than striving to produce fruits in a situation decidedly unfavorable to them. However, we can see no great impropriety in adopting the mixt method here recommended by this intelligent horticulturist to a certain extent in cold situations, but we think it entirely useless in the neighbourhood of London, or other equally favorable situations, and we are convinced that the fruit produced by such a mode of pruning will be much inferior to that which is produced on the young wood entirely.

Where peach or nectarine-trees have by bad management, or other causes, become naked at the bottom of the wall, or the middle of the tree, and are otherwise in a decaying state, they may be headed down, and the soil renewed; but if in a very bad state, we would recommend the renewal of the borders, and the planting of young trees, as the most certain mode of procuring both fine fruit and healthy trees.

NAILING AND ANOINTING THE BRANCHES OF PEACH-TREES.

At whatever season the operation of pruning is performed, whether in autumn, mid-winter, or spring, as soon as the trees

are pruned, they should be carefully replaced on the wall, if it be not intended to retard the buds, by keeping them detached as long as is deemed necessary from the wall. In nailing them, observe to leave sufficient room in the shreds; it is a good rule to go by, to allow as much room as would admit another shoot of equal size along with that laid in, to allow plenty of room for the swelling of the shoots. In young luxuriant trees, this is of the utmost importance, for when this precaution is not attended to, the shoot swells so fast, and not having sufficient room in the shred, is compressed on all sides, and often almost cut through. This produces a wound, which, in most cases, ends in the death of the shoot. In driving the nails, care also should be taken to lay their heads in a position sloping from the shoot, or branch, in order that they may not grow over them, and nails with the smallest heads should always be used, and no more used than are absolutely necessary to keep each branch in its proper place. Old nails should never be used until they have been re-pointed; and if there be any apprehension of insects being either on the trees or in the wall, the nails should be cleaned before using, which may be readily done by boiling them in water alone, or in a mixture of soap, sulphur, and tobacco. The shreds once used should never be used again, as they are apt to contain the insects, or their eggs; and as the expense is trifling, it is better to guard against such enemies, than to combat them in any other way. In making the shreds, they should not be any broader nor longer than is necessary for the sort of tree intended to be nailed, and each size kept separate in the making, which will be found more convenient when they are to be used. Strong shoots of trees may be securely fastened to the wall with small pieces of tarred cord, instead of shreds, it is more strong and durable, and is not liable to harbour insects, the portion of tar upon it keeping them off.

The trees should, previously to nailing, be washed or anointed, both for the destruction and prevention of insects. This is an important business and should not be neglected, and as no time in the year is so well calculated for the operation as winter, when the leaves are off, and the trees disengaged from the wall for the convenience of pruning, this ope-

ration can also be more conveniently and effectually executed. Many preparations and compositions have been recommended for this purpose. Independently of every gardener having his own approved wash or preparation, which he finds, from experience, answers his several purposes, either for the removal or prevention of his insect enemies, many quack recipes have been imposed on the public, and, we need not say, without exhibiting one of the many excellent virtues which they are pretended to possess. Sulphur and tobacco seem to be the two substances that the majority of gardeners use and recommend, with the addition of soap, probably more for its adhesive property, in making the others remain longer on the trees than they otherwise would; it is also of use as a cleanser and softener of the wood.

PRUNING APRICOTS.

Apricots bear their fruit both on the young shoots of last year, and also on spurs arising on the two or three year old branches. The Moor Park apricot bears chiefly on the last year's shoots, and on close spurs formed on the two-year old wood. In pruning, therefore, attention must be paid to provide as much of such wood or spurs as is necessary. The operation may be performed from the fall of the leaf till the beginning of March, in mild weather. When it is deferred till the buds begin to swell, the blossom-buds can be better distinguished, as has been observed for peaches and nectarines. In performing the operation of pruning, cut out some of the most naked parts of the two last years' bearers, and all naked old branches, not furnished with a supply of young wood, or promising healthy spurs, either to their origin or to some well-directed lateral, as most expedient, to make room for training in a supply of young and fruitful wood. Cut clear away all dead, or decaying old wood, or spurs, and observe to leave a leading shoot at the end of each branch, either a naturally placed terminal or one formed by cutting. Where a vacancy is to be furnished into a proper leader, let the shoots retained for bearers be moderately shortened. Reduce strong shoots in the least proportion, cutting off one-fourth or less of

their length; shorten the weak shoots by taking away one-third, and sometimes one-half, and cut such as are very weak to one or two buds. This shortening will conduce to the production of a supply of lateral shoots the ensuing summer, from the lower and middle placed eyes, whereas, without it, the new shoots would proceed mostly from the top, and leave the under part of the wall and middle of the tree naked. Never prune below all the blossom-buds, except to produce wood, in which case, cut nearer to the origin of the branch, as noticed above. As on these trees small fruit-spurs, an inch or two long, often appear on the two and three-year old wood, these spurs should generally be retained for bearing; but when any of them project foreright too far from the wall, cut them clear off; for spurs projecting above two or three inches from the wall, although they may blossom, and even set their fruit, they seldom ripen them, and when they do, the fruit is never good in quality, unless the situation and season be both very favorable. The thick clusters of spurs, which form on old trees, ought also to be either thinned, or if not particularly wanted, cut entirely away. As each tree is pruned, wash them, as directed for peaches and nectarines, and let them be immediately nailed in closely and regularly to the wall, observing the same caution, as to driving the nails in a sloping direction, and having the shreds of a proper size, according to the size of the branches. Apricots are generally and very justly trained in the fan manner.

PRUNING AND TRAINING CHERRIES AND PLUMS.

Both cherries and plums produce their fruit on spurs, and on the young wood of the preceding year, and therefore, to prevent repetition, may be considered under the same head. Fan-training is also to be preferred to any other, for reasons already given; the horizontal mode, however, may be with more propriety adopted with cherries and plums, than with either peaches, nectarines, or apricots. Morella cherries we should always prefer fan-trained to any other method, as they produce their fruit chiefly upon young shoots of the last year, or on close spurs formed on the two-year old wood, and should

be trained much in the manner of peaches. Considering, therefore, that they are to be trained in this method, let the branches be arranged at the distance of eight or nine inches apart, according to their strength and size of the foliage. Old trees are apt to form their spurs into clusters, which ought to be neatly thinned out, chiefly cutting away the parts farthest from the wall, and retaining those placed nearest to it, that the fruit produced upon them may be benefited by its influence. If the trees be in a healthy state, and if there be an appearance of plenty of fruit-buds on the young wood, that is, the shoots and branches of the preceding year, the largest of the spurs may be cleared away, or very much thinned, as the fruit produced from such young shoots as can be laid in close to the wall, will be much superior to that produced on spurs, both in size and flavor.

Clear the trees of all sickly, diseased or dead shoots, dead spurs, or any lateral spray that may have grown since the summer pruning, observing to cut clean into the old wood with a sharp instrument, and not to leave a ragged wound, which would admit moisture, and soon produce decay, as well as gum and canker, to which all stone-fruits are liable, from wounds arising from bruises or careless pruning. If it be necessary to use the saw in removing large branches, smooth the surface of the cut with a sharp knife, and paint over the wound with any sort of paint most convenient, in order to exclude the air and wet until the young bark heals over it. In established trees of these sorts, no shortening should ever be done, unless in such cases, where a vacancy has arisen in the tree from the loss of a branch by accident, or otherwise; in such case, shorten either the next, or the two next, in order to produce shoots to fill the vacant space. The leading shoots of such trees as have not yet filled their respective places on the wall, should be shortened, and treated nearly in the same manner as has been directed for apples and pears. Small shoots that abound with fruit-spurs, and are perfectly ripened to their extremities, may be laid in, if wanted as temporary shoots, that is, until they have ripened off their fruit, and then cut out altogether; but if wanted to fill up a vacant space, shorten them into a good wood-bud, or lay them in at full length.

PLANTING AND PRUNING RASPBERRIES.

Where fresh plantations of raspberries are intended to be made, this is now a proper season for that purpose. The ground should be either deeply dug or trenched, and if not in good condition, should be moderately enriched by the addition of manure. The pruning of these plants may now also be proceeded with, removing all old wood, and all the branches of the last season's growth which are weak or not well formed, as well as all good wood which is superfluous, leaving only from three to five of the strongest and best shoots, which will be sufficient for producing the ensuing crop.

PLANTING AND PRUNING GOOSEBERRIES AND CURRANTS.

New plantations of these fruits may now be made, and the operation of pruning them expedited, as they are sufficiently hardy not to be injured by the severest frosts. All worn out or decaying branches should be removed, as well as all the young spray of the preceding year's growth, unless in those cases, where a branch or two may be wanted to supply the place of those decayed or worn out. Choose some of the best formed shoots for this purpose, and such as are most contiguous to the space intended to be filled. The last young shoot, at the point of each leading shoot, should be retained and left unshortened, to act as a conductor of the sap to the extremities of the plant. The bushes should be kept reasonably thin of wood, particularly towards the middle, to admit of a free circulation of both sun and air to the fruit.

FEBRUARY.

PLANTING FRUIT-TREES.

Fruit-trees of all sorts may be planted any time this month when the weather is open. Let every sort be planted at a proper distance, that the trees may have, for some years, plenty of room to grow, without interfering with each other. For the respective distances, see the *Introduction to the Fruit-Garden*.

The distances at which they should be planted may, at the first sight, appear considerable, but under favorable circumstances, they will soon fill the spaces allotted to them. Trees planted on low walls require to be planted at a greater distance than on higher ones, in order that they may have greater scope to be trained horizontally, where they cannot be trained in the fan manner.

In planting all kinds of fruit-trees, it is of the greatest consequence to them not to be planted too deep. Open for each tree a circular hole or pit, wide enough to receive the roots when fully spread out, so that none of them will rest upon the sides of the pit. Then prepare the roots by pruning away all injured or broken ones, and shortening the long naked roots, that are not furnished with fibres. The good roots even, if too many, should be thinned out, for as the branches are to undergo a similar operation, by thinning out weak, useless, or decayed shoots, and shortening the strong and luxuriant ones, according to their strength, in order to cause them to push out shoots, where required, for forming the head of the tree; the roots, likewise, should be pruned in proportion to the branches, and the branches in proportion to the roots. In thinning the roots, be careful not to cut away but as few as possible of the smaller ones or fibres, as they are the principal organs which procure and convey nourishment to the trees. This done, spread out the roots and fibres, carefully bedding them in the compost prepared for that purpose, already noticed. If it be considered necessary, from the nature of the soil, to

plant entirely in the above compost, let that be done; if the soil be good, use only a little merely to cover the roots, then fill in the common earth, gently pressing it round the roots, first with the hand, and, after a great portion has been put in, afterwards with the foot; but this should be done carefully, so as not to injure the roots by bruising them, nor tearing them from the stem of the tree. While the mould is putting in, gently pull up the tree, and shake it carefully about, if the mould be dry and friable, so that the finer particles may get into the clefts among the roots, leaving no spaces unoccupied with mould about the roots. Before placing the trees in the pits, have, either in a large tub, or by pouring water on the ground and stirring it up to form a thick consistency, a puddle, in which to emerge the roots two or three times, or as often as may be deemed necessary, until a sufficient quantity of the puddle attaches itself to the roots. For the roots of all trees, excepting peaches and nectarines, this puddle may be made with the liquid drainings of the dunghill, diluted with water; or in want of that, add a portion of good dung to the mould, of which it is made. When the trees are planted, let them, if wall trees, be headed down according to whatever mode of training it is intended to adopt, and then neatly nailed to the wall. If standards or dwarfs, prune them accordingly, and let them be staked in a neat and careful manner, to prevent the wind from blowing them about; observing to place a pad of hay, or old mat, between the tree and the stake, where they come in contact, to prevent the bark from being taken off by the friction. When the operation of planting and supporting is completed, give each a gentle watering, according to the state of the mould in which they are planted, letting them be planted rather wet than otherwise, and cover over the surface, as far as the roots may extend, with littersy dung or fresh turf, turning the green side undermost; this is to remain until it be entirely rotted, and then may be carefully pointed in, but not so deep as to injure the roots. The intention of this covering is not so much for a manure, as a means of preventing the drought from affecting the roots, and to keep the mould damp round their roots as long as possible, or until they have taken fresh root.

PLANTING ORCHARD-TREES.

If the orchard has been trenched, or prepared as has been already advised under that head, and if the soil be dry, and the weather open, the several fruit-trees may now be planted. Having brought them to the spot, proceed to trim their roots and branches, as directed in the last article, and plant them in the manner there laid down, giving each tree a portion, more or less, according to the soil, or other circumstances, of the prepared compost directed to be prepared for them, and on no account fail to puddle the roots of them well. After planting, let them be properly staked and supported, and the ground mulched or covered round their stems, as above directed. If the orchard be not sufficiently fenced to exclude hares, each tree should be protected from them by being well bushed round with thorns, or otherwise secured. The trees being planted, the ground between them may be put in order, by manuring, if necessary, and digging, to be ready to receive such crops of seeds or roots, as may be deemed most useful to the owner. It is a mistaken notion that ground planted with fruit-trees should be kept entirely for them, at least for the first years of their growth. The operations of hoeing and cultivating it, will much improve the trees in their young state, and the crops obtained by the public fruit-grower will help to pay his rent and the expense of cultivation. In private orchards or fruit-gardens, it will be a useful appendage to the culinary-garden, and by cultivating it, the gardener will be enabled to give rest to a part of his ground, which has been under culinary crops for years. After the fruit-trees are established, it may be sown down in grass, both for neatness and profit. When the trees are once in a bearing state, they will, under favorable circumstances, pay for the ground, and at such a time, cropping underneath them should be abandoned.

DRESSING FRUIT-TREE BORDERS.

Let all the fruit-tree borders be neatly dug over, as soon as the pruning and nailing of the trees are finished, which should now be forwarded with all expedition. In digging fruit-tree

borders, care must be taken not to dig too deep, for fear of injuring the roots of the trees; and in doing this, prefer to use a three or four-prong'd fork to turn the ground with instead of a spade. If the borders have been ridged up in autumn, level down the ridges, and dig the whole over again in a neat manner. The borders will then be in readiness to crop, as circumstances may require, and the whole will have a neat and orderly appearance. It is a mistaken notion to suppose that fruit-tree borders should be left uncropped; the crops generally taken off those borders are of the earliest sorts, and are all annuals, and mostly taken off for use before they have come to their full perfection; indeed many of them, such as salads, which generally occupy a large share of those borders, are used in their first stage of growth. The only crops likely to exhaust such borders are some of the brassica tribe, such as early crops of cauliflowers and cabbages; but for those crops, a sufficient quantity of nutriment is laid in for them at planting, and without the advantages of such borders, from what quarter is the gardener to expect his early culinary productions, which in themselves are, in most cases, of equal importance to fruits? We have never seen any ill effects from borders being cropped with vegetables, provided that it was not carried to the extreme; and if the trees be managed on good and proper principles, we are confident that no ill effect can be produced. However, for those borders on which peach and nectarine-trees are planted, we have already said, that dung in its simple state, should be avoided as much as possible; still, a dressing of a rich compost-mould, composed of fresh maiden loam, vegetable mould, and dung rotted to a sufficient degree, and blended together, should be annually given them, and this will be sufficient both to nourish the trees, and to produce all the culinary vegetables that are generally grown on such borders. During the summer months, these borders may rest, particularly the southern ones, as at that season few vegetables can be brought to perfection on them; but for autumn, winter, and early spring crops, they cannot be productive of any injurious effects. The necessary stirring, digging, and hoeing of the ground must be of much benefit to the trees.

RASPBERRIES.

Raspberries, where they remain unpruned, should be completed this month. Clear away all decayed stems, and leave three or four of the strongest of last year's shoots standing on each root, to bear next summer: all above that number, on every root, must be cut away close to the surface of the ground.

Each of the shoots which are left should be shortened either now or in March (see *January*).

New plantations of raspberries may be made this month, where wanted; let them be planted in rows four feet asunder, and let the plants be three or four feet distant from each other in the rows. See *last month*.

PRUNING FIGS.

For particular remarks, see *March*.

PLANT AND PRUNE GOOSEBERRIES AND CURRANTS.

If these were omitted to be either planted or pruned last month, let that now be done. In pruning those bushes, observe to cut away all cross-growing branches, and regulate those, which advance in a straggling manner from the rest; or, where the branches stand so close as to interfere with each other, let them be thinned properly, so that every branch may stand clear of the other, at a regular distance, and prune out the superabundant, lateral, and other useless shoots of last summer. Look over the currants upon the walls, and give them a regular pruning and arrangement. Encourage young wood, particularly from the bottom, and annually cut away a sufficient portion of the old wood to make way for the young. Let the shoots be laid in about four or six inches apart, and neatly nailed to the wall.

Gooseberries and currants may be planted any time this month, if in quarters, at six or eight feet apart; if upon walls, from three to four feet. Plant currants, particularly red and white ones, on all spare pieces of wall or pales, having a northern aspect; they will, if protected by nets, keep long,

and be useful in autumn. A few of these, and some of the earliest gooseberries, should be planted on a wall having a southern aspect, to come in before those in the open garden; they may be planted only for temporary purposes between any other wall trees, that have not yet filled their allotted space, and as they fill up, cut out the gooseberries and currants. Raspberries planted in this way come both early and improved.

PRUNING PEACH-TREES.

The buds of peaches and nectarines will now begin to swell, and may be pruned as directed last month. Where young maiden trees are planted, or have been planted last year, head them down according to their respective strengths. The weakest shoots to be cut back to one or two buds, and the less weak to four or five, and the more luxuriant ones may be laid in still longer, for they will naturally throw out sufficient shoots, with which to form the frame of the tree; whereas, if cut in close, it would only induce them to push of course few buds, and those too gross and strong. Strong trees are to be brought into proper habits by laying in plenty of wood, and when they fruit, allowing more to ripen than otherwise would be deemed prudent; it will check their luxuriance, and fit them for more regular treatment.

This is the time to model a peach-tree into whatever shape or habit may be required, and too much attention cannot be paid at this, and the subsequent prunings for the first three or four years. Many trees are for ever spoiled, by having their shoots laid in at full length, thus producing trees with a small portion of fruitful wood at their very extremities, while their bottom and centre are entirely naked. By judiciously shortening these trees, a sufficient supply of young wood will always be obtained, and fruit in proportion. Trees allowed to run themselves to their extremities become so weakened that they neither do nor can produce much fruit, and what little they do produce, is of very inferior quality. By good management, peach-trees will, in the third year after planting, be brought into bearing, and will continue so for many years, if the border has been prepared in a proper manner and occasionally re

newed, provided care be taken to keep them full of young wood at the lower parts of the wall. When any large branch requires to be cut off, cut it close to where it arose from, leaving a neat wound, which should be painted over to prevent the moisture from getting in to cause decay. In taking out a branch of any considerable size, a space will, consequently, be left vacant upon the wall; this space must be filled up as soon as possible, and may be done by altering the branches, both above and below it, bringing the one down and the other up, so as to leave the tree as entire as possible.

Some regulation should also take place on the opposite side of the tree, by altering some of the branches, in order to give a degree of uniformity to the whole tree, and to keep up, as it were, a true balance, so that one side may not, by becoming more powerful than the other, rob it of its share of nourishment. It will, in some cases, be even necessary to thin out some of the healthy branches from the opposite side to allow of this balance, and it is on this principle of practice that some of the continental fruit-growers place the greatest importance. When peach-trees run up, as it were, to the top of the wall, leaving three-fourths of it vacant, they should be cut back as far as any young shoots or buds appear. Never head them down, as is done with apples or pears; they will seldom break again, and if they do, they will never be worth occupying a wall with: it will be better, in such cases, to root them out, as recommended last month.

DIGGING THE GROUND AMONG GOOSEBERRIES AND CURRANTS.

The pruning of these trees being finished, let the ground among them be dug over, adding manure if necessary. Dig carefully, so as not to injure the roots, and observe to bury most of the dung in the centre of the intervals, in order to feed the roots as they advance, that is, in cases where they have been planted in quarters. If planted in straight lines, or on walls, the same rule ought to be adopted, so far as not to disturb other plants. As all roots are best fed at their extremities, we recommend this mode of applying the manure to that of giving it promiscuously over all the space between the

rows, and most generally close to the stem of the bushes. When these fruits are planted in quarters, they should be renewed every seven or ten years; in that case, finer fruit would be produced, and the plants could be kept within such bounds as to admit of the ground between the rows being cropped with culinary vegetables. The Lancashire connoisseurs grow their finer gooseberries in very highly manured soils, and give copious supplies of water, and often apply liquid manure. By this method, and by shading and thinning the fruit, they obtain it of such a size, that it is not surpassed in any part of the world. They not only water at the root, but often place small saucers with water under each fruit; this is what they call suckling their gooseberries. When fruit of the largest size is required, they often do not allow more than three or four berries to remain on a tree; they also cut off the greater part of the young wood, so as to throw all the nourishment possible into the fruit.

By digging the ground at this season, or during any of the winter months, such insects as may be deposited in their larvæ state in the ground will be destroyed, or buried so deeply that the heat of the sun will not be sufficiently powerful to re-animate them, at least at an early period of summer, while the leaves and shoots are in a tender state. With a view to this effect, Tweedie, an experienced gardener, pares all the earth from under the bushes to the depth of about three inches into a flat ridge between the rows; on the first dry day following, he either treads, beats, or rolls these ridges, and trenches the whole down one and a half or two spades deep, observing to tread the foul earth into the bottom of the trench.

MARCH.

PLANTING WALL, ESPALIER, AND STANDARD FRUIT-TREES.

Such of these trees as have not been planted, either in autumn or the two preceding months, should now be planted without delay, especially if it be a forward season, and before the trees are too far gone in vegetation. In all soils, this is a proper season to plant; directions for which, see the two last months.

HEADING DOWN OR RENEWING OLD FRUIT-TREES.

When trees become stunted and diseased, either by old age, bad soils, or unskilful management, they should now be headed down, or otherwise renovated, or else cleared out and young ones planted in their stead. Most trees may be renewed by heading down, which is the simplest mode, and one that is the most often adopted; indeed all trees, excepting the peach and nectarine will be much improved by being headed down, on their showing symptoms of decay or disease. In performing this operation, the whole of the head or branches of the tree should be cut off in a careful manner with a saw, if their branches be large; and with a pruning chisel, if less strong; or with a knife, if not of large dimensions; observing, in using the saw, to smoothen the wound over with a sharp knife, and to make the cut in a sloping direction, for the purpose of allowing the water to pass freely off; and after the operation is finished, paint the wound over with any mild paint, to resist all possibility of moisture lodging in the wound. In heading down, cut all the ramifications of the tree off a few inches above the graft or bud; and if it be thought necessary, from their exhausted state, let them also be carefully taken up, unless very old; their roots examined, and all diseased or bruised roots shortened or removed; at the same time replant them in either fresh mould brought from the compost-yard, or, if the

soil be pretty good, only add a part of new to the old soil. If circumstances will admit, in replanting, remove the trees a little out of the spot on which they formerly grew, or if convenient, take them to a greater distance. Let them be carefully planted, as already recommended for planting fruit-trees, and a plentiful supply of water given; then, while the process of filling in the mould is going on, and after all is finished, give some water to settle the mould about the whole. At most seasons of planting, a plentiful supply of water should be given, indeed so as to form the whole mould into a thick sort of puddle. In light soils, this is of the greatest importance to the future growth of the trees, and more so in planting old trees than young ones. During the early summer months, water should be copiously given, not only at their roots, but over their heads. Some rotten dung, or littery matter, may be placed round their stems, to prevent the air and drought from penetrating to their roots; and the stems should be enveloped with old mats, or moss tied round them, and, during the ascent of the sap, kept moist by pouring water occasionally upon them. Under such treatment, fine healthy trees may again be made of those which were both diseased and barren. The training of the new shoots thus produced differs in no respect from that of young trees of the same sorts. Much has been lately said in regard to producing a state of fruitfulness in barren and unblossoming trees, and various plans have been tried with different degrees of success. Almost every description of fruit-tree will come into bearing in regular course, according to its nature, if planted in a proper soil, and one that is not too deep, provided the roots do not penetrate into a bad sub-soil, and produce canker, and finally death. A shallow soil is more likely to produce fruitful trees sooner than a deep one, and therefore care ought to be taken in planting, to prevent their roots penetrating too deeply. If they penetrate into a cankering gravel, they soon get into a diseased state, and no fruit can therefore be expected from them. And if they get too deep in a soil that is really good, they, by some means, not always obvious, acquire the power of throwing much superfluous sap into the tree, which spends itself in leaves and branches instead of blossoms. To correct this superabundance of sap,

has been a consideration of the horticulturist for above a hundred and fifty years. The celebrated Evelyn recommended the system of laying bare the roots; this certainly will, in some measure, produce the desired effect, but at the same time may be productive of a worse, namely, the death of the tree. Nature has never directed the exposure of the roots, but studiously hides them from sight; but every one must have observed, that trees partially blown over, or with the earth removed from their roots, or the roots mutilated by digging too closely to them, or with their trunks or roots broken or beaten, or otherwise mutilated, are always more fruitful than others; and this, no doubt, first suggested the idea of artificial mutilation. Mutilation, both in plants and animals, is attended by a sort of maturity, and maturity, in all living things, is the period of reproduction. Nature, in all cases, when she begins to feel the effects of decay, generally makes a grand effort to reproduce its species.

Certain operations may, however, be performed, and which may justly be called the system of pruning the roots, in order to correct irregularities, and induce the stronger and almost naked roots to throw out a greater number of fibres, wherewith to collect a sufficient supply of nourishment, as well as by shortening the stronger and tap-roots from penetrating too far in search of food, and keeping up, as it were, a just proportion of roots to the branches of the tree. The branches are shortened to produce more fruitful shoots, and the stronger roots should be shortened, to cause a supply of fibrous roots to push for collecting food to nourish them. Strong naked roots collect no nourishment, but serve the no less important office of conveying that nourishment collected by the fibres to the stem of the tree, by which it is conducted to the larger branches, which, in their turn, convey it to the smaller, and they to the extremities of the buds and leaves. Transplanting trees frequently, as we have already advised, produces this effect, while it answers a no less important one, namely, that of removing the tree into fresh food, and is of all methods the most rational. Boring a hole in the stem of the tree, and driving in an oaken plug, is spoken of by Van Osten as being practised in his time. Cutting notches in the stem and branches

has been recommended. Partial decortication was recommended by Arnaud d'Andilly in 1650, and of late years has been practised by many on standard fruit-trees. Stripping off pieces of the bark was recommended by Marshall. Ringing the stem and branches was known to the Romans, and is mentioned by Virgil, Columella, &c. Duhamel revived this practice amongst the moderns, and since his time, it has been practised in Holland and Germany. A. Hempel, a Saxon, so late as 1815, published an account of this practice, of which he claims to be the inventor. The use of ringing was, in all probability, introduced into England soon after Duhamel's experiments were published. Dr. Darwin, in his notes to *Phytologia*, describes the practice and accounts for its effects. It was brought to the notice of the Horticultural Society by a paper of the late Dr. Nöhden, and was then considered a new principle. It is now frequently practised, both for the purpose of inducing blossoms on trees, or rendering them productive, and for accelerating the maturity and increasing the size of the fruit. The former has been termed *production-ringing*, and the latter *maturation-ringing*. The former should be performed in the spring, and will produce its effects the following year; the latter mode should be performed when the plants are in blossom, and will show its effects the same season. Bending down the branches has been recommended to produce fruitfulness, by fixing balls of clay to the extremities of the shoots of young apple-trees about midsummer, which, by depressing them, is supposed to stagnate the sap and induce the production of flower-buds. The latter mode is the least objectionable, as it cannot have much effect on the health of the tree. The others are all founded on the same principle, namely, depriving the tree of health. This appears to be the conclusion drawn by Mr. Sabine upon the merits of ringing. "There is," he says, "a pear-tree against one of the walls in the kitchen-garden belonging to his Majesty at Kew, which underwent the operation of ringing about fifteen years ago. The part operated on was near the root, and as it was a principal arm, about one-half of the whole tree became influenced by the operation. This half has uniformly borne fruit, the other half has been nearly barren. The por-

tion of stem which was laid bare was about six inches wide, and it has not again been covered with bark. That part just above the ring is considerably larger than the part below it. The ends of the branches appear in much decay, and there are but few young shoots thrown out from the sides; whilst on the other part of the tree, the shoots as usual proceed from the extremities, as well as from the sides of the main branches. I apprehend," he adds, "from the present appearance of the whole, that the portion of the tree, which by the separation of the bark, has been deprived, in a great measure, of supply from the root, cannot survive many years."

A more rational mode was adopted in the gardens of Lord Mansfield, in Perthshire, by cutting the roots of the trees nearly to their stem; and this operation was performed in the beginning of July, and with every success. It is necessary to state, that this operation was performed not only on a single tree or two, but on a wall four hundred feet long. In most cases, when barrenness proceeds from the roots absorbing a greater portion of nutriment than is really necessary, which will often be the case, when the borders are either naturally, or have been made too deep, this shortening of the roots will be of much service. But when barrenness proceeds from an insufficiency of nutriment, which is also often the case, and which is easily seen by the trees getting into a stunted state, making little or no wood, and the little that is made small and sickly, then taking up and replanting again, as advised above, is the only cure, and this system, while it induces fertility, produces first the principal cause of that fertility, by renewing the health of the tree and supplying it with proper food.

PRUNING FRUIT-TREES.

It is not yet too late to prune the trees, but the sooner it is now done the better, especially as the plums, cherries, apricots, figs, and the early kind of pears, are now coming into flower. If the orchard-trees, and the various kinds of standards, were not pruned in the preceding months, it may now be done. When, however, the branches of any kind of fruit-trees are to be anointed, it would not be proper to delay the

pruning after the first week in the month, which, if it be postponed, the buds are very apt to be injured, or perhaps entirely rubbed off.

HEADING DOWN NEWLY-PLANTED FRUIT-TREES.

At the end of this month, the trees that were planted in or about the preceding October should now be headed down. On this subject Nicol very justly observes: "Trees that are intended to be trained horizontally, and have but one shoot or stem from the graft, should be headed down to four or five buds, out of which, if three spring, it is sufficient; one to be trained upright, and one on each side, horizontally. If a plant have two shoots, cut away the weakest, and treat the strongest as above. But if the plant be furnished with three shoots, (and such are always to be preferred for this mode of training,) head down the middle one only, as above, if moderately strong; but to ten or twelve inches, if very stout; and lay in the other two, right and left, perfectly level. If these be quite entire, and ripened to the extremities, they must not be shortened."

On the other hand, trees that are intended to be trained in the fan manner, having but one shoot, should be headed down to four or five buds, if they be strong, and to three or four, if they be weak, in order that the wall or rail may be filled from the bottom. Those trees which have two or three shoots, may be headed to four or five buds; from which, if they all flourish, a proper number are to be reserved for the formation of the tree.

The newly planted trees, which are two or three years from the bud or graft, should now be well cut in; that is, the shoots of last year should be shortened back to a few buds on each, for the purpose of enabling them to push the stronger, and to produce shoots to fill the wall or rail from the bottom.

GOOSEBERRIES AND CURRANTS.

The beginning of the month, finish pruning gooseberry and currant-bushes, where they have not yet been done. Keep

the branches thin, and the middle open, so as to admit the sun and air freely; by which means the fruit will be large and well tasted. Observe the rules laid down in *January*.

Dig the ground between the gooseberry and currant-trees, if not done in the two former months, which, as they are just advancing in bud, will be of great service, in promoting the growth of large good fruit.

Finish planting gooseberry and currant-trees, as early in the month as convenient. See *January, February, &c.*

PLANTING AND PROPAGATING FIG-TREES.

This is a proper season to plant fig-trees, as those which are planted at this time are found to succeed better than if planted at any other period of the year. This tree is readily propagated either by cuttings or layers, and in either state can be procured in the public nurseries in pots, where they are grown until they have attained a proper size and age for planting. Let them be carefully turned out of the pots without disturbing the ball, and planted in any good garden-mould, observing to give them plenty of water as soon as planted. If planted against a wall, the shoots should be immediately nailed in, to prevent their being broken, to which, from their brittle nature, they are very liable. Cover the surface round their stems with rotten dung, or littersy matter, to exclude the spring droughts, as directed above for other fruit-trees. Figs may now also be propagated either by cuttings of the shoots, or by laying their lower branches in pots sunk in the ground for that purpose. They will, during summer, if moderately supplied with water, strike root, and be by next spring fit for planting out if wanted; and if left for another season, be in a good state, either for that purpose or for potting in large pots for forcing.

PRUNING AND PLANTING RASPBERRIES.

Prune raspberries, observing to cut out all the dead wood; and where the live shoots, which were produced last summer, and which are the bearing wood of this year, stand too thick,

let them be thinned out as in the former months, and shorten the shoots which are left.

The ground between the rows of raspberries should now be dug, it will strengthen the shoots, and add a neatness to the place.

Plantations of raspberries may be made any time this month: they will take root soon after they are planted, grow freely, and produce fruit the same year: give them some water occasionally in dry weather, till they have taken fresh root.

In planting raspberries, remember it is the young shoots which were produced from the old roots last year, that are the proper plants; choosing those, the roots of which are well furnished with fibres, and one or more buds formed at bottom for new shoots, and rejecting such as have naked, hard, woody roots. Let them be planted as mentioned in the two former months.

GRAFTING FRUIT-TREES.

Almost every cultivator of fruits has experienced some disappointment in finding, when his trees arrive at a bearing state, that many of them turn out to be very different from what he expected, and this is not often detected, particularly in the case of pears, for many years, nor until the trees have attained a large size. It is a mortifying consideration to have to root them out, and to plant others, by which he is not certain he may not be equally disappointed. The only alternative, in such cases, is to head them down, and to engraft upon their branches or stems, the scions which he may procure of the sorts desired. The operation of grafting may be successfully performed upon trees of almost any age or size, although, no doubt, the younger the tree or branches are, that are to be grafted, the greater success will attend the operation. But if properly done, it may be performed on trees of all sizes and ages with tolerable success. There are many modes of grafting; the following are in most general use.

Ring, shoulder, or crown grafting, is that in which the grafts are set in a circle, or crown, and is chiefly practised on large trees, where either the head or larger branches are cut off horizontally, and two or more shoots or scions put in,

according to the size of the branch and stem. In performing this operation, the scions or grafts are cut flat on one side, with a shoulder to rest on the crown of the stock; then the rind of the stock is raised up, to admit them between the wood and the bark of the stock, which must be inserted about two inches, so that the shoulders may meet, and closely join the crown of the stock, and after the whole of the scions are inserted, all the crown of the stock should be well clayed over, leaving only two eyes of the grafts uncovered, which will be sufficient for shooting. This method of grafting was much more in use formerly than at present, owing to the bad success with which it was attended; for as the grafts are placed between the rind of the stock and the wood, they are frequently blown out by strong winds, sometimes after they are in a bearing state. Where this method is practised, the young shoots should be properly supported by stakes. It is a convenient way for grafting old trees cut down to the surface.

Cleft, or slit-grafting, which is performed on stocks and branches of smaller size, may be adopted with success, where the bark or rind is not too thick, by which the inner bark of the graft will be prevented from joining that of the stock. In performing this sort of grafting, the head of the stock or branch must be cut off with a slope, and a slit made the opposite way in the top of the slope, deep enough to receive the scion or graft, which should be cut sloping like a wedge, so as to fit the slit made in the stock, care being taken to leave that side of the wedge, which is to be placed outward, much thicker than the other; and in putting the scion into the slit of the stock, great care must be taken to join the rind of the scion exactly to that of the stock; for, if these do not unite, the grafts will not succeed: when this method of grafting is used to stocks that are not strong, it will be proper to make a ligation of bass, to prevent the slit of the stock from opening; after which, the whole should be clayed over, to prevent the air from penetrating the slit, so as to destroy the grafts, only leaving two eyes of the scions above the clay for shooting. It is usually performed about the beginning of March.

Whip, or tongue-grafting, is the most generally practised by nurserymen, especially for small stocks, or branches of an

inch, half an inch, or less, as the scions much sooner cover the stocks in this method than in the others. It is performed by cutting off the head of the stocks sloping; then making a notch in the slope towards the upper part downward, a little more than half an inch deep, to receive the scion, which must be cut with the slope upward, and a slit made in this slope like a tongue, which tongue must be inserted into the slit made in the slope of the stock, and the scion be placed on one side of the stock, so as that the two rinds of both scion and stock may be equal and join together exactly; after which there should be a ligature of bass put round to fasten the scion, so as that it may not be easily displaced, the whole being afterwards clayed over as in the former methods. It may be performed in the early spring months.

Grafting by approach, inarch-grafting, is performed when the stocks that are designed to be grafted, and the tree from which the graft is to be taken, stand so near together as that their branches may be bent and united. It is commonly practised on tender exotic plants, and some other sorts which do not succeed in any of the other methods. In performing the work, a part of the stock or branch is slit off about two inches in length, a smooth part of the stock being always chosen for the purpose; then a small notch made in this slit of the stock downward, in the same manner as directed for whip-grafting; the branch of the tree designed to be inarched, having a part slit off in the same manner as the stock, and a slit made upward in it, so as to leave a tongue, which tongue should be inserted into the slit of the stock, joining their rinds equally, that they may unite well together; after which a ligature of bass should be made so as to keep them exactly in their situation, and afterwards this part of the stock clayed over well, to keep out the air. In this method of grafting, the scion is not separated from the tree until it be firmly united with the stock, nor is the head of the stock or branch, which is grafted, cut off until the same time, and only half the wood pared off with a slope, about three inches in length, and the same of the scion or graft. In this method of grafting, the operation is not performed so early in the season as the others; it being done in the month of April, when the sap is flow-

ing, at which time the scion and stock will join together, and unite much sooner than at any other season or period of the year. It is principally employed in raising camellias, oranges, and other exotic trees of the harder kinds.

It has been found that the walnut, fig, and mulberry will take by this method of grafting, while neither of them succeed well in any of the other modes. Several sorts of evergreens may likewise be propagated by this method of grafting; but all the trees that are grafted in this way are weaker, and never grow to the size of those which are grafted in the other methods; therefore it is rarely practised, except on such sorts of trees as will not take by the other methods of performing the operation.

Root-grafting is performed by cutting the clean smooth roots of the stocks in pieces five or six inches long, and as large or a little larger than the graft; then they are whip-grafted, and tied together very closely, so as to prevent the wet from affecting the wounded parts, planting them so deep as that the graft, which should be four or five inches long, may be about half buried.

Side-grafting resembles whip or tongue-grafting, but differs in being performed on the side of the stock without being headed down. It is sometimes practised upon wall-trees, to fill up vacancies, and sometimes in order to have a variety of fruits on the same tree. Having fixed on those parts of the branches, where shoots are wanted to furnish the head or any part of the tree, then slope off the bark, and a little of the wood, and cut the lower ends of the scions to fit the part as near as possible, then join them to the branch, and secure them with bass, and clay them over as in other sorts of grafting.

Shoulder, or chink-grafting, is performed with a shoulder and sometimes with a stay at the bottom of the slope. It is chiefly used for shrubs and ornamental trees, where the scion and stock are of the same size.

Saddle-grafting is performed by first cutting the head off the stock in a wedge-like form, and then splitting up the end of the scion, and thinning off each half to a tongue-shape; it is then placed on the wedge-like stock, embracing it on each side, and the inner barks are made to join on one side of the

stock, as in cleft-grafting. This is a very strong and handsome mode of grafting for standard trees, grafted at the standard height, as it makes a good finish, covering a part of the stock, which in other methods long remains a black scar, and seldom or never becomes covered with bark. The stocks for this purpose should never be much thicker than the scions. In some cases, two scions may be inserted, and the stock by that means will sooner be covered. There are two other varieties of saddle-grafting described by Mr. Knight, neither of which differs from this in the end which is to be obtained; although they are in themselves curious, and their rationale described by that eminent horticulturist in his usual masterly manner.

Peg-grafting is an old method, in which the stock being cut off horizontally, a hole is bored in the centre of it, and the scion being selected to fit the stock; within an inch and a half of its lower end, a circular incision is made, and the part between that and the end reduced so as to fit the hole in the stock. This peg filling the hole is supposed to secure the graft from the effects of winds. It is now seldom practised. Besides these modes described, there are many others. The late Professor Thouin enumerates above forty methods of grafting, besides a great many modes of budding and inarching; and M. Louis Noisette has published a description of one hundred and thirty-seven modes. These are, however, only varieties of the more common ones, and their shades of difference are so slight, or remotely connected with utility, that they do not appear to attract the attention of any but the curious, and are not likely ever to come into common practice.

Cleft, or crown-grafting, is the method generally adopted by those, who by this plan renovate old trees, or who, for fancy and amusement, engraft many different varieties on the same tree. If it be intended to renovate a tree, all the branches should be headed and grafted; whether it have been fan or horizontally trained. They should not be all cut to equal lengths, but to different ones, that the new wood may issue, nor all at one part, in a crowded manner, but at various heights, in order that room may be given to train it properly. Two, three, or four grafts should be put on each branch, according to its size, so that if two or three fail, the taking of

one may be insured; which is generally sufficient to leave, unless it be thought expedient to leave two on the larger branches, or on the stems of those trees which have been trained horizontally, and have been headed entirely down.

In grafting on branches more than two inches diameter, crown-grafting is the method most generally used; for smaller stems or branches, cleft-grafting should be preferred.

The period or season for grafting should always be regulated by the state of the weather. From the climate being so uncertain in the spring, it is better to defer it till the circulation of the sap be brisk, and the buds of the stocks begin to break, attention being paid that the weak shoots of tender trees will not admit of being so long cut as the more hardy, and that the operation should never be performed while it actually freezes or rains.

Grafts or scions should generally be chosen from the young shoots of last summer's growth, and those from the outside or lateral branches are the best; although we have both recorded and experimental evidence to shew, that wood of more than one year, and indeed of several years' growth, will succeed. Mr. Knight, the Baron Tschoudi, and others, have grafted young shoots in leaf; and Van Mons, at Brussels, has grafted an entire tree of fifteen feet in height on the stump of another of similar diameter. But for general practice, the outside lateral shoots are preferred, because they are not so robust, nor so apt to run to wood, as those from the centre or top of the tree, nor so weak as those at its base, and under the shade and drip of the rest. Such shoots are found from experience to produce the truest specimens of the fruit of the tree from which they are taken.

An exception to this rule is to be found when the trees are in a sickly state, when, of course, the grafts should be taken from the strong shoots in the centre, or near the top of the tree. The ends of each scion should be cut off, unless it be a sort which is wished to be propagated, and only one or two scions to be had. In all cases, where there are plenty of scions, use only the middle part, rejecting both the top and base of the shoot; or if the shoots be long, and of a rare variety, they may be then cut into several lengths of six or seven inches

each. They should be cut off the parent tree some time previously to their being used, experience having shown that it is necessary to allow the stock to have the advantage over the graft in forwardness of vegetation. The sap of the stock should be in active motion at the time of grafting, which would also be the case with the scion, if left on the parent tree; whereas the grafts being taken off some time before, their buds will consequently be kept back, and ready only to swell when placed upon the stock. Grafts should be collected any time in January, or the beginning of February, and kept at their whole length, laid in dry mould, in a situation where they are not exposed to either frost or much sunshine, until they be used; or they may be taken off in autumn, provided that the wood be properly ripened, and sent to any distance, having one end packed in clay, rather dry than moist, and a covering of moss over all.

The greatest care should be taken in procuring grafts, so that they come not from trees infested with insects, or of diseased habits, and also that they be cut off the tree, the sort of which is particularly wanted; and after being cut, should be immediately labeled, in a correct and legible manner, that no disappointment may occur: after having been at the expense and trouble to procure grafts from a distance, should they turn out to be different from what they were intended, such a disappointment will be great. At this season, we would recommend to have grafts of part or all of the seedling fruits planted in the shrubbery or otherwise, put on in order to prove their merits; they should not be all put on one tree, nor in one situation; some should be tried on walls, some on espaliers, and some on standards, in order that their relative merits may be ascertained. Probably the first year of their fruiting they may not be so fine, as they will be at a more mature age, therefore they should be allowed a few years, and if we find that they progressively improve, there will be some hope of having in time a new or good variety.

Implements proper for the work.—These are principally, a neat small hand-saw, for cutting off the heads of large stocks; a good strong knife, with a thick back, to make clefts in the stocks; with a sharp pen-knife, or budding-knife, to

cut the grafts with; and a grafting-chisel and small mallet. Other sorts of instruments are sometimes necessary in performing particular sorts of grafting.

Besides these tools, other sorts of materials are wanted in performing the business, such as bass-strings, to tie the grafts with, which should be selected from a fresh new mat, and a quantity of good tough clay, which should be prepared a month before it is wanted, and kept turned and mixed, like mortar, every other day, in the following manner:

A quantity of strong good clay, in proportion to the quantity of trees intended to be grafted, should be provided, and some new horse-dung broken in among it; and if a little cut straw or hay be mixed amongst it, it will hold together the better. These should be well stirred together, putting water to them occasionally, in the manner of making mortar. The whole should be hollowed like a dish, filled with water, and kept every other day stirred. It should be carefully kept from being exposed to frost or drying winds; and the oftener it is wrought over the better.

The grafting-clay of the French and Dutch is composed of half cow-dung, free from litter, and half fresh loam, well incorporated. Several substitutes have been recommended for clay; for fruit-trees, however, there is not any thing better than clay, which has been so long in use. The others are used for grafting tender exotics, whose tender frames would be liable to be broken by the weight of clay necessary for the exclusion of air and moisture, which is all that the clay or any other substitute is used for. Whatever sort of clay is used, it is of the utmost importance, that it be used as soon as possible after the scion is put on, to prevent the extravasation of the sap from the wounds, the too sudden drying of the wood, and the introduction of rain-water into the wound or cleft; and whenever it is damaged by drying too soon, or other accidents, it should be instantly repaired. In very dry springs, or when the clay is not very tenacious, or any particular sort of graft, to avoid accidents, or failure, it is advisable to cover the clay with moss tied on in a neat manner, and to give frequent waterings, either with the garden-engine, or watering-pot with a fine rose. When the grafts are put on near the

ground, where it is practicable, draw some of the mould round the stem of the stock, so as to cover the ball of clay; it will be of much benefit to the taking and growing of the scions.

To the amateur who objects to the use of clay, the following composition, recommended by Mr. Powell, may be considered as an excellent succedaneum. Take one pound of pitch, one pound of resin, half a pound of bees'-wax, one quarter of a pound of hogs'-lard, a quarter of a pound of turpentine, melted and mixed well together. This composition is kept in a fluid state, by putting it in an earthen pan over boiling water; with a brush it is then spread evenly on sheets of moderately thin brown paper, which, when cold, is cut into slips about three-quarters of an inch wide. The scion being fitted to the stock, take one of these slips, warm it by breathing on it, and bind it round the graft, when it will be found to serve the purpose both of matting and claying.

WATERING AND PROTECTING NEWLY-PLANTED TREES.

All fruit-trees planted in autumn, or early in the spring, should be protected from the effects of high winds, by being properly staked up, as already directed, and also occasionally watered, which will be of much importance to their breaking strong and taking properly to the soil.

DIGGING THE FRUIT-TREE BORDERS.

Dig the fruit-tree borders: this will be serviceable to the trees, and destroy weeds; and the borders will appear neat, and be ready for sowing or planting with crops of small growth, or such as will not much exhaust the soil.

Hoe the surface of such fruit-tree borders as were dug in the foregoing months, and are not sown with crops; such as radishes, spinach, lettuce, &c.

PLANTING STRAWBERRIES.

This is a good season for making new plantations of this valuable and excellent fruit. In preparing the ground for

them, it is necessary that it should be trenched or deeply dug, the roots of these plants penetrating to a great depth, and at the same time well manured. They may be planted in rows at from eighteen inches to two feet apart, according to their kinds, or in beds, each containing three rows, with alleys of three feet between the beds, and the rows eighteen inches apart in the beds, and the plants twelve or fifteen inches apart in the line, according to their sort. Choose the young plants from the runners of the preceding season well rooted, and be careful not to mix the sorts, while collecting the plants. Indeed, every sort of strawberry, where it can conveniently be done, should be grown in separate beds, and at such a distance, as will prevent their running into one another. Never plant old plants by any means, but have the runners of the preceding season taken off when well rooted, and put into nursing-beds, to gain strength, they will be in good condition to plant in spring. The duration of strawberry-beds depends on a variety of circumstances, sometimes they will last for ten, twelve, or more years, and often only for two or three crops; and some cultivators only allow them to remain on the ground one year. The Rev. Thos. Garnier, of Stoke, near Southampton, a successful cultivator of this fruit, destroys all his beds early in August, as soon as the gatherings are over, and then proceeds to form new ones by trenching and manuring them; he selects his plants from the strongest runners of the old rejected plants. If the weather should be particularly hot, and the surface of the ground much parched, he defers the operation of preparing and planting his beds till the ground be moistened with rain. Such is the simple mode of treatment which he has adopted for several successive years, and such is his success, that he produces a greater quantity of excellent fruit on a given piece of ground than that of any other gardener in the county. Depth of soil, he observes, is absolutely necessary, and in his opinion, it is needless to plant many of the better kinds of strawberries, where it is not of a considerable depth. In this we perfectly agree with Mr. Garnier, and must observe, that the finest and greatest crops of this fruit we ever saw, were in his garden. It is not generally known, but it is an ascertained fact, that most straw-

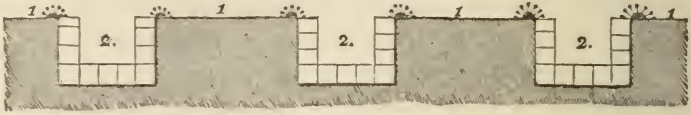
berries generate roots, and strike them into the ground nearly two feet deep in the course of the season. The pine, Grove End, and roseberry, succeed better than any other in stiff and shallow soils, and should be planted in an open situation, and not in one too much shaded. Many sorts of strawberry are now raised annually from seed, which is sown when the fruit is ripe. Plants are produced to plant out at this time, and if planted in rather a moist situation, will produce abundance of fine-flavoured fruit the following autumn. The Alpine strawberry should always be raised from seeds, and differs from all others of the same family, inasmuch that it produces abundance of fruit the same season that it is sown. For this purpose, it is sown in spring, on a bed of rich earth, and sometimes in pans or shallow boxes, where, in the latter way, it is forwarded, by being placed in some of the forcing departments, not too warm, and when above ground gradually hardened to the open air. By such means, it gets rather stronger than those reared on a bed of light earth out of doors. In July, or August, they are, in either case, fit to plant out for good, which is generally done in a shaded situation, either behind a wall, or hedge, in rich moist soil, allowing the plants two feet apart, row from row, and one foot apart in the line. In this way, abundant crops are obtained, and will continue bearing until destroyed by the frost. The season of this fine fruit can thus be prolonged for a considerable time: forced roseberries, pines, or Alpines, being ripe in March, and the seedling Alpines in fruit till the middle of November. In making plantations of this fruit, plenty of room should be allowed them, that they may not be destroyed in the process of watering or gathering them. The hautboy generally thrives best in light soils, and cannot be scarcely over-dunged, as it is not so likely to be thrown into a superfluity of leaves by manure as some of the others. There are various sorts of this species, all of them esteemed for their fine flavor; one variety has the parts of fructification so perfect, that it bears plentifully, being capable of fecundating itself; while some other varieties are so imperfect, that they contain the male parts in one flower, and the female in another. Still those latter varieties are reckoned the finest

flavored fruit. Keen, a respectable market-gardener, and a successful cultivator of this fruit, observes, that great care is necessary to be taken in selecting young plants of these sorts for making out new plantations; that there be a proper proportion of male plants to the female, not having too many of the former, as they bear no fruit, and are more prone to run into leaves and runners than the other. He considers, that the proportions ought to be one male to ten females, and states his experience for making such a choice. Having formerly been in the habit of selecting female plants alone for his beds, he failed in being able to procure crops; but in 1809, suspecting his error, he obtained some male blossoms, which he placed in a bottle on the bed of female hautboys. In a few days, he perceived the fruit near the bottle to swell. On this observation, he procured more male blossoms, and in like manner placed them in bottles in different parts of the beds, removing the bottles to fresh places every morning, and by this means obtained a moderate crop where he had no fruit the preceding year.

In making out fresh strawberry plantations, attention should be paid to the above, as far as regards this species of strawberry. The distinctions between the sexes can be most readily observed while in flower, and the plants should be then marked; or in selecting them while in fruit, choose ten young plants from those which bear fruit, and one from those which are barren.

Strawberries require a larger portion of water than almost any other of our cultivated fruits to bring their crops to perfection. A considerable expense is incurred on this account by the strawberry-growers in the vicinity of London and Edinburgh. They seldom have the opportunity of selecting a naturally moist situation for this fruit, and the formation of an artificial strawberry-garden would be attended with too much expense for them, the quantity which they cultivate being so great. A very rational and useful strawberry-garden is described by W. Atkinson, Esq., in the *Horticultural Transactions*, Vol. V. p. 191, which was observed by that scientific gentleman some years ago, in the vicinity of Chatham, and was the invention of a person at that place.

The beds (1) were on flat ground, each about three feet wide ; between them were trenches, (2) about nine inches wide, and four-inch walls of brick-work on each side, to keep up the earth



of the beds. These trenches were about the depth of two or three courses of brick laid flat without mortar, and were intended for the purpose of holding water, which was supplied from a pump whenever the ground was dry, while the plants were in fruit.

In Devonshire, the same gentleman observes, that strawberry-beds are constructed against the side of a hill or bank, by building up beds in steps, with rough granite at the front to keep up the earth, each step being about two feet high, and three feet wide. These steps are filled with good loam, and the surfaces of the beds covered with rough pieces of granite bedded into the loam, leaving openings between the stones, just sufficient to put in the plants. The surface being thus covered with stones, the ground is thereby kept moist, and the fruit always clean. Beds on this plan might be readily made in any situation, by using bricks or any kind of stone for keeping up the mould, and covering the surface with tiles or pebbles, or any sort of stone most convenient. This will not only be a great saving of labor in watering, but, if neatly done, will be a convenient mode of cultivating them, and the fruit may be gathered without any chance of treading on it. If a situation were provided, either with a natural spring or stream of water upon the top of such a bank, it might, with little trouble, be made to irrigate the beds, when in bloom, or the fruit swelling ; and if let off when nearly ripe, the reflection of the sun, if the bank sloped towards the south, would be such as not only to give a high flavor to the fruit, but also very much to accelerate its ripening. In such cases, where water cannot be got naturally, a pump, such as is described for the Chatham strawberry-beds, might be used.

We have always considered a strawberry-garden to be a desideratum ; and the advantages gained would repay both the

expense and the trouble of its formation. It would be of great importance to have it so constructed, that the beds might be supplied with plenty of water at the least possible expense. Either of the above methods would answer well, or if there be the convenience of a small island in a pond or piece of water, it would be an admirable situation for a strawberry-garden, and would answer the purpose, provided that the surface was not too high above the level of the water. In such a situation, beds made in the common way would answer very well, as the roots of the plants would get down into a cool wet bottom, which they are fond of in summer. In winter, when they might probably suffer from being too long kept wet, the water might be let down to a lower level; but if the plantations be annually made, this precaution would not be necessary. Strawberries may be secured from the attacks of birds by surrounding the compartment, where they are grown, with wattled hurdles, made close on purpose, or rendered so by drawing in a few branches in the places at which birds might penetrate, placing them upright like a fold, and then covering the whole top surface with netting, supported high enough to admit of getting conveniently to gather the fruit. The fruit of Alpine strawberries, and probably some of the other prolific sorts, may be retarded till late in the season, by going over the plants in May, or when they come into blossom, and carefully cutting off all the bloom with a pair of scissars, preserving the leaves as much from injury as possible; this is repeated until towards the middle of June, when more blossoms appear, and those are left to produce fruit, which they readily do until destroyed by the autumnal frosts.

A P R I L.

PROTECTING THE BLOSSOMS OF FRUIT-TREES.

The pruning and nailing of all fruit-trees being finished last month, many of the earlier kinds will now be coming into blossom, and in this precarious climate will, in many situations, require protection from cutting winds, as well as from the effects of frosts, which of late years have cut off the crops of fruit while in their tender state; and in many of the finer sorts of fruits, such as peaches, nectarines, &c., done much injury to the expanding shoots. Various have been the opinions of the propriety or impropriety of protecting trees, and as many plans have been recommended as there have been opinions advanced on the subject. The majority of practical gardeners, however, agree in the propriety of protecting, by some means or other, the blossoms and young shoots of all their tender trees. In situations, so happily placed as to render shelter unnecessary, much labour and expense will be saved, and the trees upon the whole will be less injured, than by the most ingenious mode of covering that could be adopted. Upon a subject of so much importance, we will give the substance of the different modes pursued with as much brevity as possible.

The most simple and primitive mode is, that of covering with fronts of ferns, spruce, or other branches, stuck in amongst the branches of the trees, and generally remain until all danger from frost is supposed to be past. This is done on a rational principle in Sweden, Denmark, and other parts of the north of Europe, to retard the blossom by excluding the rays of the sun, which often, at this early season, shine with great warmth throughout the day, by which the sap is set in motion and the flowers are induced to expand, while the nights follow with severe frosts, and either destroy the fertilizing pollen of the male parts of the fructification, or render them unfit for their important offices, by which the chance

of fruit is entirely destroyed; the sap once set in motion, the young tender shoots push forth, and are destroyed by the frost, which nightly follows. By retarding the motion of the sap; by excluding the trees from the effects of sunshine at this early period, and detaining them, as it were, by apparently continuing the winter; they are thus retarded, until the danger of frosts be past, and then allowed to break into bud and blossom, at a season more congenial to their natures. This principle has been acted upon in Scotland, and in some parts of England, to a considerable extent. Of all sorts of branches used for this purpose, we would recommend those of the common fern, *Pteris aquilina*, as being lighter, and therefore not so liable to injure the buds by being blown against them with high winds. But we consider this plan objectionable, as it shades the bloom too much, and too constantly from the light, by which the buds are rendered weak, and the fruit produced often drops off in a premature state; and it is probable, that the crop would have been as good, had the trees been left to take their chance.

Protecting with straw-ropes has been recommended in the Transactions of the Horticultural Society, and is performed by placing poles in front of the trees against the walls, at four or six feet apart, one end being fixed in the ground about a foot from the wall, and the other to the top of the wall with a nail. A quantity of straw or hay-ropes are then prepared, and passed from pole to pole, taking a turn round each all the length of the wall; about eighteen inches above that, is placed another row of rope in a similar manner, and so on until all the length of the pole or height of the wall is completed.

Protecting with nets is often practised, and was recommended by the late Mr. Nicol. The old nets used for protecting fruits from the attacks of birds, are hung over the trees sometimes doubled or trebled, according to the quantity to be had. In screening with nets of any kind, they are to remain on day and night, until all danger of frost be over. Nets are very good screens if properly put on; they are generally put on in a very careless manner, without any seeming consideration of the actual cause. They are generally hung over close to the branches, the flowering-buds often sticking out beyond

the nets, which of course derive no benefit from them. Instead of being hung up in so unmeaning a manner, they should be placed out at the distance of fifteen or eighteen inches from the walls, by means of sticks of that length placed with their but-end against the wall, and their other end either slit or having a natural fork to keep the net more steadily out; and these placed at the distance of two or three feet apart. In putting on the nets they should be put on pretty tight at first, and their ends nailed close to the wall on all sides, then these sticks put in to keep them from the wall, will tighten them up sufficiently to render them steady, that no wind can displace them.

Nets made of woollen yarn are much better than any other sort of net, and may be made or purchased at a trifling expense, and will last for many years. These nets are in general use in Scotland, and in some places in England. The advantage they have over nets made of flax or hemp is, that their meshes are rendered much smaller than they really are by the bristleness of the material, and its constant tendency to contract; and by its disposition to attract moisture, such as cold dews and hoar-frost, protects the blossom, while a sufficient portion of light gets in to the trees. It may be rendered more or less close in texture by tightening or loosening it, according to circumstances. This simple contrivance was invented, in 1805, by two ladies in Perthshire, for their brother's garden. Nets made of straw are used in the Dalkeith gardens, and of bass in the gardens of Sweden.

Protecting the blossom with mats is a common method, but is very troublesome, and in the end expensive. Protecting by means of oil-paper frames is adopted in some places with success. These frames are made like common sashes, only very slight, and are covered with common printing paper of the cheapest quality, which after being pasted on, is painted over with boiled linseed-oil. These frames are placed in front of the trees, and made moveable by contrivances, which must vary according to circumstances. If the slope from the wall be considerable, a few frames must be made to fit the spaces at the ends. These frames are not put on until the blossoms are pretty well expanded; till which time they are not very apt

to suffer by hail-showers, frost, &c. In this way, there is much less danger of rendering the blossoms delicate by the covering, than if it were applied at an earlier period. These frames, if taken care of, will last for many years, and will be useful for ripening melons, cucumbers, or protecting flowers, and many such purposes.

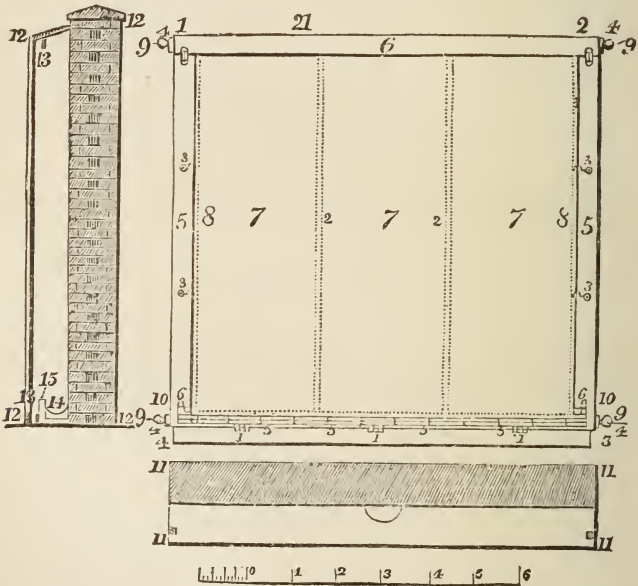
The bad effects of frost in still weather, which may be said to fall perpendicularly, may be guarded against by fixing a temporary coping of boards to the top of the wall, so as to project a foot or a foot and a half over the trees, and may be removed when all danger of such frosts are over; but these perpendicular frosts are less injurious than cutting frosty winds, which, while they prevail, to a certain degree, blast every species of vegetation.

The most effectual guard against the ill effects of frost and winds, at this season, is canvas screens, recommended by Nicol, which, while they break the force of the winds, and sufficiently guard off the frost, do not prevent a sufficient quantity of light from penetrating to the trees. The cloth for this purpose should be very thin, like what is called bunting; and that it may last the longer, and admit more light, it should be oiled.

The screens may either be fixed in frames, or may be put up in single sheets, and be made to answer for one or for several trees, as they may happen to be placed on the wall. In either case, they should be placed clear of the tree, that is, about the distance of a foot at top, and eighteen inches at bottom. If in frames, they may be made to move in the manner of a common sash, between rafters, and may be double, as in windows, to go either up or down, in order to admit air. The rafters being made moveable, the whole may be removed or put up at pleasure, and if carefully dried, and packed up in a dry room, when not in use, will last many years. If the screens be made in sheets, they may be mounted upon rollers at the top of the wall, and lowered or taken up at pleasure; but in this case, it is also necessary to have a set of slight rafters, or neat poles, laid against the walls at proper distances, to prevent the wind from dashing the canvas against the trees, the effects of which are too obvious to mention.

These sheets may be of any convenient length, and made to cover one or more trees, as may be required. If the trees be planted according to their several kinds, as we have recommended, then the whole space may be covered with one or more pieces of this covering, and will be more convenient than if the trees were scattered about on different parts of the walls. In using these screens in either of the above forms, the trees are always to be exposed to the light and air, in good weather, through the day, covering only at night and in bad weather, applying them from the time the buds begin to open, till the fruit be fairly set, or till all danger from the effects of frost be past.

A frame for the protection of fruit-trees on walls has been invented by Mr. John Dick, gardener at Ballindean, in Perthshire, which although at first sight may appear rather intricate, yet will be easily understood by the accompanying sketch.



It is made of thin semi-transparent canvass, about 36 inches broad. The edges and seams of the screen are bound with tape, and it runs on two wires placed at top and bottom of the frame, and kept tight by screws at the extremities.

1. 2. 3. 4. are the four corners of the wooden frame, when joined together and fixed upon the wall.

5. 5. are wooden facings fixed on the front edge of the sides of the frame for the reception of the screen within them.

6. 1. 1. 1. are similar facings on the top and bottom, but moveable on hinges, shewn at 1. 1. 1. for the convenience of putting the rings of the screen upon the iron wires 9. 9. 9. 9.

7. 7. 7. are the breadths of the screen, strengthened by slips of tape 2. 2. sewed upon the seams.

8. 8. are the two upright pieces of wood, to which the screen is nailed, which slide under the facings 5. 5., and are secured by the hasps 3. 3. 3. 3.

9. 9. 9. 9. are the iron wires on which the screen slides, by means of rings.

4. 4. 4. 4. are thumb-screws, for tightening the wires and preventing them from relaxing.

5. 5. 5. 5. are the rings upon the bottom wire. When the screen is adjusted, the lower facing 1. 1. 1. is folded up to 10. 10., and fastened with square buttons 6. 6.

11. 11. 11. 11. the plan of the wall and the bottom of the frame, with a semi-circular hole cut in the latter, sufficiently large to receive the stem of the tree, and thus to prevent the frame being fixed close to the wall.

12. 12. 12. 12. the section of a side of the frame and of the wall.

13. 13. are the top and bottom stops, to keep the screen in its place.

14. is a piece of cloth loosely suspended between the wall and the upright stake 15, to receive the fruit that falls off the tree; the stake 15 is repeated at convenient distances in the frame.

This frame has been tried in the gardens of the Horticultural Society, and found perfectly to answer.

The sudden transition from cold to heat, which we experience in the sultry hot sunny days of spring succeeding frosty nights, is the principal cause of the failure of crops of our finer fruits in the open air. The blossoms get frozen through the night, and the sun acting with all its power on them in the morning before they are at all thawed, destroys many,

and injures the rest. The effects of shading, of whatever sort, counteracts this evil less or more, as by it the frost may be prevented from injuring the blossoms; or, when they have been affected, by shading them from the sun's rays, until they become gradually thawed. The frequent occurrence of this circumstance has led to the adoption of a very rational mode of cure, by thoroughly watering the blossom or young fruits with cold water, applied with a garden-engine, in the morning, before the sun shines upon them. If the blossom, or even the fruit, be discolored, this application of cold water recovers them; but it is necessary, that this be done before the sun shines upon them. Sometimes one watering will not be enough to recover the parts affected, in such cases, it must be repeated two or three times, until every appearance of frost be gone, and the blossoms or fruit attain their proper color. The operation of watering before sun-rise, in counteracting the frost, seems to produce its effects in a manner similar to the application of cold water to a frozen joint or limb, which is injured by the sudden application of warmth. This plan has been long adopted by the London nurserymen, when their plants have been affected by frost during the night, and is attended with the most marked success. Vegetables of any sort may be recovered by this application, and it should be attended to by the gardener both in spring and autumn.

WATERING NEWLY-PLANTED FRUIT-TREES.

Any of the fruit-trees that have been omitted to be headed down last month, should be done now as soon as possible, and all newly-planted trees attended to in regard to watering, which must be repeated as the state of the weather may require.

DESTROYING INSECTS ON FRUIT-TREES AND BUSHES.

Insects of many species will now begin to make their appearance; therefore, to keep these intruders under, it is necessary to begin upon their first appearance, and continue diligently to watch their progress during the season. Most of

them only live for one season, but their powers of reproduction are so great, that no time should be lost in destroying them as they appear, or in removing all appearances of them in a yet imperfect state. That industrious naturalist, Leuwenhoeck, by calculation discovered that two house-flies, a male and female, will, in three months' time, produce no less than seven hundred thousand of its species. The insects most injurious to the productions of the garden are: the red spider, (*Acarus tellurius*, of Linnæus,) (*Aphis lanigera*), or American blight; the wasp (*Vespa vulgaris*, of Linn.); the earwig, (*Forficula auricularia*); the bug, (*Cimex*); the thrips, the chermes, the cabbage-moth (*Phalænæ oleracca*); the gooseberry-moth (*Phalænæ wavarria*); the currant-moth (*Phalænæ grossulariæ*); and the codling-moth, very common on fruit-trees (*Phalænæ pomonella*); the wood-louse (*Oniscus*); the earth-worm (*Lumbricus*); the slug (*Limax*); and the snail (*Helix*); the ant (*Formica*); and caterpillars (*Papilio*); the aphides, or green-fly, and grubs, or the larvæ of the beetle (*Scarabæus*) tribe.

The destruction of these insects ought now to occupy our attention, and will be no difficult matter, if taken in time. The red spider makes its appearance in dry hot weather, on peach, nectarine, and many other trees and plants; and, as Nicol observes, is always found on the under sides of leaves, but most often on rough downy leaves, where it is protected in its young state by the hair on the leaves. This, however, is not without an exception, for we find it also on leaves perfectly smooth, and devoid of all covering. Its attacks are less frequent upon the apricot, than on most other fruit-trees. It is amongst the smallest of the genus, and is not easily distinguished without the assistance of the microscope. If the back of the leaf be viewed by the aid of that instrument, it will appear full of its webs, and if many abound on it, the leaf appears full of punctures, becomes discolored and brown on the upper surface, fades and falls off. This insect is more troublesome in hot-houses than out of doors, and more in dry warm seasons, than in moist and cold ones. Water has been considered to be the only cure, and it must be used in considerable quantities. If the insect has got once established on

the leaves, it is not mere sprinkling that will dislodge it; it must have the water applied with force from the garden-engine, and that in a considerable quantity, and repeated twice each day, or oftener, first working the engine from the right hand side of the tree, and then from the left, so that no part of the leaves can escape a general washing. If this be properly attended to, it will not only keep the insect off altogether, but will drive it off, however strong it may be. It is of much consequence to the trees that it be not allowed to gain a-head, for in that case, many of the leaves will fall off, or be unable to perform their functions, and consequently the tree must suffer a great check. The operation of washing should be performed in the evening, particularly as at that time the effects of the moisture will not be so soon lost; but if there be any appearance of frost, it had better be done early in the morning, before the sun has any effect upon the trees.

The *Acarus holosericus*, or scarlet acarus, an insect similar to the red spider, and belonging to the same genus, is equally destructive to fruit-trees, and is often by gardeners confounded with it. Water is the only cure for it, applied in the same way as for the red spider.

Wasps will be considered more fully, when we come to treat of their attacks upon ripe fruits. In the mean time, care should be taken to destroy every one that makes its appearance, for by destroying one at this season, a whole nest is thereby prevented from being formed. To promote their destruction, an equal sum ought to be given to the destroyer of a queen wasp at this season, as for a nest in autumn. Nothing has been found to keep down this troublesome insect so effectually, as remunerating the operatives in and about the garden with so much money for each insect destroyed at this season, as well as for each nest when fully formed.

Ear-wigs.—As the ear-wig retires during the day to hide in some hole, it may be caught by hanging bean-stalks, cut into short lengths, in various parts of the tree or plant that it infests, into which it is almost sure to go, and upon examining them they may be taken out and destroyed. They are very destructive to flowers, more so than fruits, and are carefully sought after by the florist.

The *bug* or *coccus* genus.—Of this genus there are several species, chiefly named from the plants on which they feed, such as the pine-bug, vine-bug, orange-bug, and peach-bug; the three first are generally found in hot-houses, and will be noticed in the *Forcing-garden*. The bug found upon the peach should be brushed or rubbed off, and if that practice be persevered in, it will soon clear the trees of them. All washes and powders are to be considered merely as palliatives; nothing will eradicate these insects equally to picking them off.

The *Thrips* genus consists of very small insects, which are sometimes very troublesome in melon and cucumber frames. Water dashed upon the leaves will drive them off, and fumigations of tobacco may also be used. The shoots and leaves, which they attack, become shrivelled, brown, and pulverize between the fingers, as if they were burnt. They are curious insects when viewed through the microscope. They have four wings, and walk with the lower part of their body turned upward.

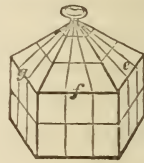
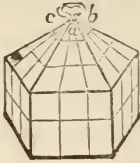
The *Chermes*, is a genus very generally confounded with the aphid. It also inhabits the leaves and stems of plants, and by its punctures produces excrescences of various sizes and shapes, which generally contain the egg or immature insect in the larva state. Its destruction is similar to that of the aphid.

The genus of *Phalænæ*, or moths.—Of these, the cabbage, gooseberry, currant, and codling-moths, are most destructive to garden productions; and, in their caterpillar state, are found on the leaves of the plants, on which they feed, and from which they derive their name. In the latter part of summer they are to be picked off by the hand, or where the leaves are much eaten with them, may be gathered off and carried away. Young ducks, and other domesticated birds, will help to keep them down.

Catching the winged insect is found to be the most effectual method of keeping under these insects. This is done by using a gauze net, which should not be above three or four feet in circumference, eighteen inches or more deep, and attached to a whalebone rim or hoop; the handle should be six feet long; with this net, a boy should be kept going round the garden, and when the insects, in their butterfly or moth state, are fly-

ing about, he can with little difficulty catch and destroy them. Thus for every female destroyed in spring, or early in summer, before they lay their eggs, we destroy many hundred caterpillars.

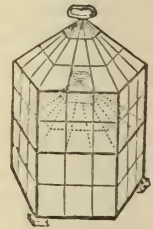
The following ingenious method of catching winged insects in gardens, is recommended, in the Gardeners' Magazine, by Mr. John Wilson, of Welbeck Gardens, Notts. Take a common hand-glass, the hexagonal or any other form will do,



remove in the apex the whole or part of three of the panes (*a b c*), then take a second hand-glass, which must be of the same form as the first, and place it on the roof of the first, so that the sides of the one may coincide with the sides of the other; then all the interstices between the bottom of the one and the eaves of the other (at *e f g*) must be stopped



with moss, wool, or any suitable substance, which will prevent the entrance or exit of the flies. The bottom hand-glass must rest on three pieces of bricks to form an opening underneath. The appearance of the trap, when completed, is simply that of one hand-glass above another.



Fragments of waste fruit are laid on the ground, under the bottom hand-glass, to attract the flies, which having once entered, never descend again to get out, but rise into the upper glass, and buzz about under its roof, till, fatigued and exhausted, they drop down, and are seen lying dead on the roof of the under glass. One of these traps placed conspicuously on the ground, before a fruit-wall or hot-house, acts a decoy. It is surprising to see the eagerness with which all kinds of insects go to examine it, and seeing various kinds of their fellows within, they enter also, and flying upwards buzz through the open panes (*a b c*),

and perish altogether in the cavity between the two hand-glasses.

The *Wood-louse* (*Oniscus*) is of retired habits, shunning the light and heat of the sun. It is easily caught by placing bundles of reeds, or bean-stalks, in which to shelter itself, like the ear-wig, which is already described.

The *Earth-worm* (*Lumbricus*), the *Slug* (*Limax*), and the *Snail* (*Helix*), are all injurious to gardens, the former to gravel and grass-walks and lawns, as well as to tender plants. The second extremely destructive to every species almost of vegetables, and the third to vegetables and fruits. The former are readily destroyed by watering the ground in which they inhabit with lime-water. The second and third are only to be subdued by carefully picking them up, and either destroying them, or carrying them to such a distance from the garden, that there will be little chance of their getting back.

It is remarked of the common garden-snail, (*Helix hortensis*), that having once attacked a leaf or fruit, it will not begin on another until the first be wholly eaten.

Ants (*Formica*).—This industrious species of insect is, in light sandy soils, often very abundant. Some say, that they eat and help to keep down the aphides; at all events, wherever the one appears in any quantity, the other is sure soon to follow. They sometimes, however, commit sad depredations on ripe fruit, excavating the whole of the interior with such nicety, that it is not till the hand be put to pull the fruit, that the theft is discovered. Their nests may be destroyed by pouring hot water over them, or burning a quantity of straw or any light matter over them. If a piece of cord dipt in tar be tied round the stem of the tree, they will not ascend it.

Mr. Wilmot's method of destroying ants, in the open garden, is, by taking a straight rod, such as the handle of a hoe or rake, and pushing it down two feet, so as to leave an open round hole of that depth, the ants will precipitate themselves into the hole, and from the smoothness of its sides be unable to get up. Once a day, some water may be poured into the hole, to drown what are there, and the round stick reinserted, so as to maintain the smoothness of its sides. This mode is known to several gardeners. Another mode is by placing

saucers, with sweet or other oil, in different places, either in the open air, or in hot-houses, which will destroy ants, beetles, crickets, and other insects, the margin of the oil being sprinkled with a little sugar.

Caterpillars, which are the larvæ or young of the *papilio* genus, are very destructive, and various means have been tried to destroy them. As their whole employment seems to be eating, when they meet with food that suits their palates, they are extremely voracious, and will soon leave leafless any plant, bush, or tree, on which they begin their ravages. But nature has provided a wise restraint on their propagation by also forming other insects which keep them within due bounds. These insects deposit their eggs in the bodies of caterpillars: from these eggs proceed small maggots, which gradually devour the vitals of the animal in which they reside. When about to be transformed into a chrysalis, they pierce the skin of the caterpillar, spin their pods, and remain on the empty skin till they assume the form of flies, and escape into the air to perform the same office to another unfortunate larva. But to man, there is room left to exercise his reason, in devising means for their destruction. Lime-water has been used, which will destroy a great part; tobacco-water will destroy more; but the most efficacious plan is to employ a few children in the garden for a few days to pick them up, and afterwards to destroy them. The garden-engine, used with the greatest force upon the bushes, will wash off many of them, but picking we have always found the most certain in the end.

In the *Agricultural Journal of Bavaria*, the following method is given for the destruction of caterpillars in an orchard:—Plant according to the size of the orchard, from one to four plants of bird-cherry (*Prunus Padus*); almost the whole of the caterpillars and butterflies within one or two hundred yards will resort to that plant. The appearance of the bird-cherry will be hideous, but the fruit-trees will be safe.

The *Aphides*, or what is more generally known as the green fly, black fly, &c., two species of the same genus, may be destroyed by the same means. They are destructive, and annoy almost all sorts of fruit-trees, and many herbaceous and flowering plants. They attack the young tips of the tender

wood, and, if not soon destroyed, will ruin the tree. This insect is not so difficult to eradicate as some of those already noticed. The fumigation of tobacco will completely destroy them, and without in the least injuring the tree. In hot-houses, the fumigation is easily performed, but upon the open wall, the task is more difficult. However, as fumigation is found to be the most effectual and expeditious mode, arrangements must be made to confine the smoke for a sufficient time near the trees to destroy them; for which purpose, spread an oil-cloth over the tree or trees intended to be operated upon, which fasten closely round the edges, so as to prevent as small a quantity as possible of the smoke from escaping; apply the smoke at the bottom, it will ascend to the top of the trees, and if confined for a short time, will completely destroy every aphid on the trees. After the fumigation, apply the garden-engine with force, which will wash off all that have not already fallen to the ground. It is of the utmost importance that this operation be performed on the first discovery of the enemy, as at that time a less quantity of tobacco will be used, and the trees less injured. Where the convenience of oil-cloths is not to be had, then garden-mats, doubled or trebled, will answer the same purpose. The more effectually to destroy them, and prevent any chance of those which have been stunned from again ascending the trees, dig the ground lightly at the bottom of the wall, which will bury every one of them. This operation is often performed with a pair of fumigating-bellows; but for extensive fumigations, we always prefer one or more small garden flower-pots, about six inches in diameter, having a hole drilled through it, near the bottom, of about three-quarters of an inch in diameter, being sufficiently large to admit the point of a pair of common bellows. The tobacco, which should be either the strongest roll, or tobacco-paper, which can be purchased at the tobacco-manufacturers for much less than the tobacco itself, should be put into the pot, in quantity depending on the size or number of trees to be fumigated; or if the roll-tobacco be used, unroll it, and tear the leaves into pieces, which will cause it to burn better; put this into the pot, and with it a portion of damp hay, or any strong disagreeable smelling herbs, such as tansy, &c.; this will add to

the quantity of smoke, and the smoke of tobacco diffused along with it, will soon destroy all the aphides upon the trees. Choose a dull cloudy evening for this purpose; but if the trees be badly infested, do not delay the operation on account of the weather, for it were better to burn an additional pound of tobacco than to allow the enemy a single day to gain strength. Small trees, or bushes, may be fumigated in this way, by throwing canvas, or oiled cloth, or mats, over them, and applying the smoke in the same way.

In regard to the cure of the *Aphis lanigera*, or American blight, the following method is recommended by Mr. James Dann, gardener to the Earl Mann Cornwallis, at Linton Place:

The method which he pursues is, invariably, first to scrape off with a blunt instrument, all lichens, and loose or rotten bark from the stems and branches, then pare off the edges of the cankered holes, and other excrescences, where it is possible for the aphid, or any other insect, to lodge in; and with a woodman's racer, gouge, or chisel, scoop out all the cankered and rotten wood, until a clean live surface be found at the bottom of each cankered part. Wanton lacerations are, however, by no means recommended.

By adopting the above method, and using the under-mentioned medicament, Mr. Dann engages to bring sound wood in the stems and branches of fruit-trees in general; though after the operation of cleansing the wounded parts, there may not be more than one inch of sound bark to carry on the circulation of the sap, provided the stems or branches be properly supported.

Take two quarts of vegetable tar, half an ounce of corrosive sublimate, half an ounce of spirit of salt, and one gill of spirit of hartshorn.

The sublimate must be pounded in a marble mortar, adding the spirit of salt by degrees to dissolve the mercury; next add the hartshorn, rubbing altogether until completely mixed. Provide an earthen glazed pipkin, and put in the poisonous liquid; add the tar by degrees, constantly stirring it to prevent its running over. Then take an old painter's brush, and cover all the wounded parts with the mixture, which will ad-

here and give way to nothing but the growing wood and bark. It is necessary to use earthenware, as the mercury will corrode metal or wood.

Wherever this mixture is applied, it will infallibly destroy the aphid, or any other insect, and prevent emigrants from infested trees lodging on the wounded parts, or feeding on the juices of the young growing bark, owing to its poisonous quality. No person need be afraid of any mischief to any domestic animal, as the noxious smell and taste of the tar prevent every danger.

Grubs, which are the larvæ of beetles, are very destructive to the roots of plants. Of this genus the most common is the *scarabæus melolontha*, the eggs of which species are deposited in the ground by the parent insect, which, from its form, is well calculated for burrowing. From each of these eggs proceeds a whitish worm, which is destined to live in the earth in that form for four years, and in that time undergoes various changes of its skin until it assumes its chrysalid form. These creatures, in immense numbers, work beneath the turf in rich meadows, devouring the roots of the grass to such a degree, that the turf may be rolled up almost with as much ease, as if it had been cut with the spade or turving-iron; and underneath, the soil appears turned into a soft mould for about an inch in depth. In this, the grub lies in a curved position on its back, the head and tail uppermost, and the rest of the body buried in the mould. Such are the devastations committed by the grubs of the cock-chaffer, that whole fields of grass, in the summer season, become in a few weeks as dry and brittle as withered hay, occasioned by these grubs devouring the roots, and destroying all those fibres which fastened it to the ground. The larvæ having continued four years in the ground, undergo another change, to effect which, they dig deep into the ground, sometimes five or six feet, and there spin a smooth case, in which they change into a chrysalis. They remain in this state all the winter, till about the month of February, when they become perfect beetles, but with their bodies quite soft and white. In May, their parts are hardened, and then they come forth out of the earth. This accounts for our not finding the perfect insect in the ground. This species of beetle should be

destroyed wherever it appears, as the means of lessening its depredations. When it appears in fields, the ground should be fallowed, and, by these means, bring the grubs to the surface, so that crows, and other birds can get at them, of which they are remarkably fond. In gardens, they often occur, and should be picked up, and destroyed the moment they are detected. Indeed, every species of grub, which is turned up in digging, should be destroyed.

WATERING NEWLY-PLANTED BUSHES.

Currants, gooseberries, and raspberries, which were planted last month, or in autumn, should be attended to with water; and where any of these remain unplanted, it should now be done, observing, in planting them, to water, or puddle-plant them, as already directed.

PLANTING STRAWBERRIES.

Strawberries should be planted the beginning of this month, if wanted, and the established plants cleared of all weeds, and the earth often stirred up about them. When strawberries are planted at this season, observe to puddle the roots well before planting, and water afterwards.

Water the beds of fruiting plants frequently, in dry weather, towards the latter end of the month, when they begin to advance for bloom; for if they be not supplied with that article, the fruit will be smaller, and of less abundant production.

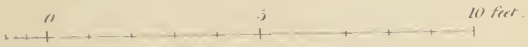
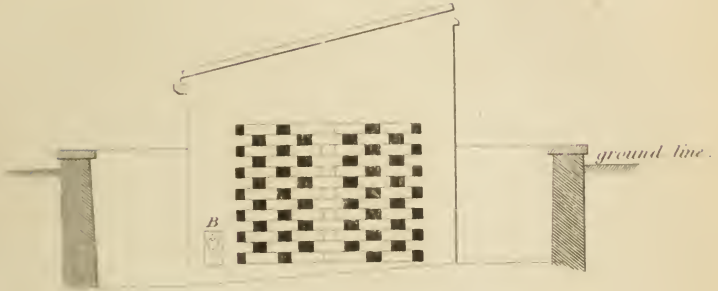
DISBUDDING, OR RUBBING OFF THE USELESS BUDS OF WALL-TREES.

About the latter end of this month, begin to look over apricot, peach, and nectarine trees; rub off the new advancing ill-placed fore-right shoot-buds, and other irregular growths, and all the young shoots which are useless; that is, all the shoots which are produced directly fore-right, on the front of the branches should be rubbed closely off, as well as those

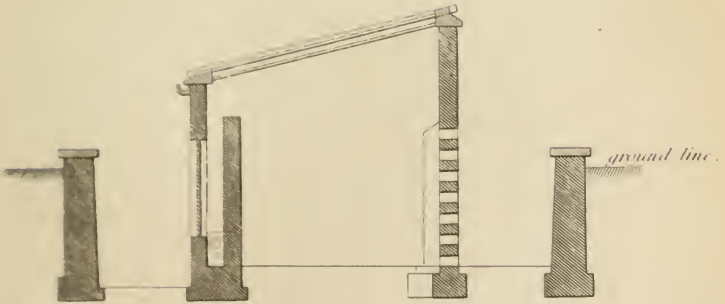


Early Forcing Pit.

End Elevation.



Cross Section.



E. & T. Currier

which arise in parts of the tree where they are evidently not wanted, and are situated in places where they cannot be regularly trained to the wall.

But it must be observed, that all regularly placed side-shoots and leaders, and such others, which are properly situated for laying in, must be left; and, when of a proper length, should, in the two succeeding months, be trained to the wall in a regular manner.

DISBUDDING VINES ON THE WALLS.

The vines against the walls should be looked over about the end of this month; they will, by that time, if a forward season, be advancing in shoots, and some of them showing fruit. The dressing or disbudding at this early season is to be performed with the finger and thumb, rubbing the shoots closely off.

Previously to the training of any tree, for the purpose of obtaining the greatest quantity of fruit, its mode of bearing should be first taken into consideration, and the object of the cultivator must necessarily be to obtain the greatest quantity of bearing wood, of an equal and proper distribution.

The vine is a creeping plant, throwing out the most luxuriant shoots at the extremity of its branches, where they are laid horizontally or perpendicularly. In training this tree, it is necessary to keep three principal objects in view: first, to cover the space allotted to it with fruit-branches, leaving room for both ripening the fruit, and the branches that are to bear fruit the succeeding year: secondly, to take off the top of each branch bearing fruit at the second or third joint above the uppermost bunch, except such branches as are destined to bear fruit the next year, which latter must be exposed, and by no means topped; for if the sap be checked in these, many of their buds will burst the same season, and the fruit of next year be destroyed: thirdly, to take off all laterals as they arise, and any shoots which, though laid in for fruit, turn out unproductive, that the whole strength of the tree may be properly applied to the maturation of the fruit, and the wood for succeeding crops.

By early regulating the vines, the grapes will advance freely in their growth, become larger, more regular, ripen sooner,

and be in greater perfection, than when the vines are suffered to run into confusion; besides, the work can be performed much sooner, and with much greater correctness, regularity, and beneficial effect, both to the vines and prosperity of the fruit.

GRAFTING TREES.

Grafting may yet be performed, if required.

The sorts which will yet succeed, are some of the late kinds of apples, pears, and plums; but they must be grafted the beginning of the month; for they will not succeed well, if done later.

NEWLY GRAFTED TREES.

Newly-grafted trees should now be often looked over, to see if the clay keep close about the grafts; it being apt to crack, and sometimes fall off. When this is found to be defective, let the old clay be taken off, and add some new in its stead.

All those shoots, which rise below the graft, must be taken off as they are produced: these, if permitted to remain, would rob the graft of nourishment, and prevent it shooting freely.

NEWLY BUDDED TREES.

Look also over newly budded trees, that is, those that were budded last summer; they will now begin to advance in their first shoots, proceeding immediately from the inoculated bud, which, having remained dormant from its insertion in the stock last summer till this season, will each push forth one strong shoot, to form the beginning of the future new tree. Examine, therefore, the young shoots, and look with a careful eye for insects, which sometimes attack them, if very dry weather. If the leaves curl up, insects are the cause of it; and, if not prevented, will spoil the shoots in their first growth. Let the curling leaves be carefully picked off; it will prevent the mischief spreading farther; and fumigate with tobacco-smoke, or wash the tips of the shoots with tobacco-liquor, soap, and sulphur, as advised for peach-trees, &c.

M A Y.

THINNING WALL-FRUITS.

The thinning of fruits, when they set too thickly on the trees, is a very important branch of fruit-tree culture, and it cannot be denied, that it is by many too little attended to. That all sorts of fruits would be benefited by being properly thinned is evident; even the most common gooseberry and strawberry would be increased, both in size and flavor, how much more so, then, peaches, nectarines, grapes, and apricots; and, although seldom practised, plums, cherries, and apples, would be improved by the process. In favorable seasons, peaches, nectarines, and apricots, set in clusters upon the trees, and, if not removed, would push one another off; but this natural effort would much exhaust the trees; it is better, therefore, to commence the operation of thinning soon after these fruits are set, and it should be performed with a pair of sharp-pointed scissars, thinning out those that are most crowded, and reducing each cluster of fruit, or where they are set so thick as to touch one another, to a reasonable extent. This operation, however, must not be completed at this early period, as circumstances may occur, of which we have no fore-knowledge, that may cause a great portion of the crop to drop off; reserving for future thinnings in June, and, in some cases, a final thinning in the beginning of July. As a general principle to be kept in view at each thinning, the largest and best-formed fruit, and such as are most favorably placed, should be retained; all others should be taken off, unless upon such shoots, or parts of the tree, where the crop may be less abundant. In such cases, a few of the less handsome fruit may be left, which will improve, as they advance towards perfection. On healthy and fully established trees, the crop should be left in a greater quantity; but upon sickly and newly-planted ones, and upon sickly or weak shoots, even of healthy trees, they should be thinned to a greater extent. No general rule can

be laid down, as to the distance that each fruit should be allowed to stand from each other; a variety of circumstances are always to be taken into consideration, such as the kind of fruit, the size which it attains, the health and state of the tree, &c.; but it is always better to thin well, as the ultimate bulk of fruit will not be decreased, gaining individually what is lost in number, and the flavor will, consequently, be improved.

DISBUDDING WALL-TREES.

By disbudding is meant a species of pruning, which is performed upon fruit-trees with good effect, and if judiciously performed, will, in a great degree, obviate the necessity of much winter-pruning; while, at the same time, it disburdens the trees of all superfluous shoots and leaves, and admits of a greater share of nourishment being afforded, both to the fruit, and also to the shoots which are laid in, for the purpose of forming the tree, and producing future crops. In performing this operation, some discrimination is necessary, so that no fruit-buds be displaced, and that a sufficient number of wood-buds be retained, and those placed in a proper position. All superabundant buds are to be rubbed off with the thumb, when they have attained the length of one or two inches, by which time a proper selection can be made. In regard to apples, pears, plums, and cherries, which produce their fruit upon spurs, these should not be disbudded until the young shoots have completed two or three joints, at which time they will be readily distinguished from the spurs, which only form a knot furnished with a few leaves, and show no disposition to form a shoot. Peaches may be operated upon sooner than most other trees, as they, for the most part, produce their fruit upon the young shoots of last year's growth, and seldom, under good management, upon spurs. In proceeding in this operation, every part of the tree should be regularly gone over, and all fore-right wood displaced, leaving upon each shoot of last year's growth the uppermost, undermost, and one or two at regular distances between them, according to the length of the shoot, the strength of the tree, and other circumstances. Young trees, while in a state of training, should have their

leading shoots carefully disbudded, as, at this period of their growth, a judicious arrangement of their shoots will tend to the formation of both elegant and healthy trees, this being the time when they can be modelled to whatever mode of training the cultivator may choose to adopt.

Upon this subject, Nicol justly observes, apples and pears, trained in the fan manner, may be treated very much as above; always observing to leave more shoots than may ultimately be necessary to lay in, for fear of accidents; that is, of trees in training. Trees that have filled the spaces, and are in full bearing state, may be disbudded of most wood-buds that appear, except in places too thin, or the leading shoots of inferior branches. Wood-buds on the old spurs are always to be displaced, as only tending to enlarge them unnecessarily.

Apple and pear-trees trained horizontally, must be treated in a different manner from the above. The leading stem of trees yet in training, is the object of most particular care. The buds on the last year's shoot, shortened as directed in January, must all be retained for fear of accidents, except those placed fore-right, till they have sprung a few inches, and it be seen whether enough will spring, for laying in right and left, of which to form the tree. Generally speaking, on the last year's shoot of the leading stem, the uppermost bud, the uppermost pair, the undermost pair, and two intervening pairs of buds, should be retained, if the stem push so many; otherwise, one intervening pair. All wood-buds on the horizontal branches of trees thus trained, except the leading one, should be displaced.

GENERAL CARE OF WALL-TREES.

Wall-trees will now require great attention, both as regards protecting them from cold cutting winds, and removing the protections of every sort, as soon as the state of the weather will admit of it. It is at this time, that they are injured by being protected at all, by allowing the branches, or other covering, to remain longer on them than is really necessary, which draws up the young shoots in a weak and tender state, and unfits them to stand the full exposure to the atmospheric air,

and sunshine. Coverings, of whatever kind, should not be taken off all at once; they should be removed by degrees, and the young shoots hardened progressively to the full exposure of the air. Insects of all sorts will now be in full strength, and care must be taken to keep them down, which, if taken in time, will save much trouble and expense. Pick off all curled and deformed leaves of the trees as they appear, and in so doing, take care not to injure the young shoots. Supply all fruit-trees plentifully with water, if the season be dry, and use the garden-engine over all the walls every afternoon, or every alternate one, with sufficient force to dislodge the insects, and wash off all dust and filth that may have gathered on the leaves. If there be appearance of frost, prefer the morning, before the sun acts fully on the trees; and after frosty nights, which we often have about the beginning of this month, use the engine before sun-rise, that is, before the rays of heat strike fully upon the trees, on eastern and southern aspects, for the purpose of removing the effects of frost. Continue to supply all newly-planted fruit-bushes with water at their roots, and occasionally over their branches.

SUMMER-PRUNING CURRANTS, GOOSEBERRIES, AND RASPBERRIES.

On this subject, Nicol observes, it is not a very common practice to summer-prune currants and gooseberries, but it is essential to their welfare, and to their production of fine fruit, if judiciously performed. It also, in a great measure, tends to prevent the ravages of the caterpillar. No doubt a moderate degree of shade is conducive to the swelling of the fruit to a full size; but if, by too much shade, it be excluded from the sun and air, it will be wanting in flavor; therefore the hearts of the plants should be regularly thinned of the cross and water shoots; and all suckers rising about the roots ought to be carefully twisted off, as they appear. If part of the shoots that rise about the stools of raspberries were twisted off, or otherwise destroyed, at this time also, it would let in the air about them; the shoots left for bearing next year would become stronger, and the fruit now upon the plants increase in size.

NEWLY-GRAFTED AND BUDDED TREES.

About the latter end of this month, look over all grafted trees, and let the clay be taken off, and at the same time, let the bandages be loosened.

All the shoots that rise from the stocks below the grafts, must be immediately rubbed off, that the grafts may not be robbed of their nourishment.

Let the same rule be observed with trees budded last summer, keeping the stock clear of all shoots, which would draw away great part of the nourishment from the bud.

WATERING STRAWBERRIES.

Strawberries should now be regularly and abundantly supplied with water twice or thrice a-week, if dry weather, and continued until the fruit begins to change color, when it should be left off, unless in extremely dry seasons, when it may be necessary to continue it, not only to swell off the fruit, but also to keep the plants alive; for although strawberries, in their natural habitats, receive, or seem to require little water, yet those which have been fed, as it were, upon that element hitherto, will miss the want of it, if suddenly deprived of it. The London and Edinburgh market-gardeners, who are and ought to be the best managers of these matters, give very abundant supplies of water to their strawberries, and incur a very considerable expense in the performance; but they find, that they are eventually paid by abundant crops, which, without that nourishment, would have been scanty and precarious. As the fruit begins to ripen, it should, if the weather be not very scorching, be discontinued, otherwise the flavor of the fruit will be injured. If they be planted in lines, or in such a manner, as the fruit is liable to be spoiled by the mould being splashed over them, either by watering or heavy rains; they should be protected by laying long clean wheaten straw carefully along the sides of the rows; or, which is better, common bricks, which, while the fruit lies clean upon them, their ripening is considerably accelerated by the reflection of

heat from the bricks, and the bricks, as well as the straw, will prevent the drought from injuring the roots. In wet seasons, we have found great benefit in laying rods, or pea-stakes, along the sides of the rows for the fruit to lie upon, which keeps them clean, and allows a free circulation to pass under them, which will prevent their rotting, and elevate them above the attacks of slugs, which prey very much upon them in such seasons. About the end of this month, let all the runners be cut off, unless where wanted for plants for young plantations. Keep the ground clear of weeds by frequent hoeing and raking.

Strawberries cultivated, as already described, either in a separate strawberry-garden, or on the sides of banks, should be supplied plentifully with water, by either of the modes already laid down. If in beds with trenches between them, the trenches should be kept pretty full of water, by either turning in a natural stream, or pumping a quantity once or twice a-day, as they may require.

Mulching, which is covering the ground between the rows with straw or litter, or by placing slates, tiles, or bricks, so as to cover the surface of the ground between the rows, evaporation will be considerably diminished, and less water will, consequently, be required to keep the roots moist, while by adopting either of these materials the fruit will lie dry and clean. Coal ashes are not unfrequently used for this purpose, which to a certain degree are beneficial, particularly in cold strong clayey soils; but on light sandy soils, their tendency to render the soil still lighter, may be attended with injurious effects. Where the soil is not already over rich, a top-dressing of rotten dung laid between the rows will be of use, both for lessening the process of evaporation, as well as affording nourishment to the crop.

J U N E.

NEWLY PLANTED TREES.

Examine all fruit-trees that were planted last autumn, winter, and spring; in particular standard-trees; and see that they be well secured, so that they cannot be rocked about by the wind.

This should be duly attended to, but particularly such standard-trees which have tall stems and large heads; for it must evidently appear, that those trees which are secured will make stronger shoots than those that are not; likewise take care to keep the earth well closed about the bottom of their stems, that the sun or wind may not have access that way, to dry the earth near the roots.

Attend to the young wall and espalier-trees, which were headed down in the spring; they will have made some strong shoots, and the said shoots should now be nailed to the wall, both to train them in regular order, and to secure them from the power of the wind.

Water must still be given in very dry weather, to newly-planted trees, in particular to those which were planted late in the spring.

Considerable advantage would be derived in continuing some mulchy dung on the ground over the roots, to keep out the parching heat and drying winds.

THINNING STONE-FRUITS.

All kinds of stone-fruits should now be again gone over, at least twice during this month, that a further thinning of their over-abundant crops may take place; reserving, however, the final thinning till next month (*which see*).

ESTABLISHED APPLE, PEAR, PLUM, AND CHERRY-TREES.

These trees will by this time have made strong shoots, both against walls and espaliers, and where this work was not done

in May, it will be necessary carefully to look over them, and to regulate them.

They will now require great care, and must be properly cleared of all unnecessary shoots. All luxuriant, fore-right, or ill-growing shoots must be taken off close, and likewise such as are produced in parts where they cannot regularly be trained in. All that are not absolutely wanted to produce a succession of wood, or to fill up vacant spaces, must be entirely cleared away.

In managing these trees, it must be observed, that although it is not necessary to leave so large a supply of young wood as for peaches, &c., and those trees which bear their fruit on the one-year-old shoots, yet such a supply is necessary to be left every year as may come round in succession, to fill up those spaces where old useless wood may, from time to time, be pruned off.

Sometimes the branches of cherry-trees begin bearing at one and two years, those of the apple and plum at two and three, and those of the pear not till they are four and sometimes five years old. Some branches bear at three years, but it is very seldom. After the branches of these trees have once begun to bear, no further necessity exists of leaving so general a supply of young wood, for they will continue to increase in bearing for many years afterwards; for which reason, when they are well furnished with good wood, it will only be proper to leave here and there, in every tree, a few of the best shoots. This work must not be now omitted, for it is possible some may be wanted to train in, in some part of the trees, at the winter pruning. In any parts of the trees, where there appears to be an absolute want of a supply of young wood, fail not to leave a sufficient number of those shoots which grow well and fit for training.

It is always the surest method to leave, in a moderate way, a sufficiency of young wood where it is apprehended it may be wanted, that there may be a choice in winter pruning, to fill up any vacancy occasioned by dead wood, &c. and it will be easy to clear away that which is not then wanted. At the principal pruning time, it is always a good maxim to leave plenty of young wood to choose from, and the branches which

are left should now be fastened to the walls, pales, or espaliers, regularly, each shoot at its full length without shortening.

APRICOT AND PEACH-TREES, &c.

If the apricot, peach, and nectarine-trees were not looked over last month, in the young shoots of the year, to give the requisite regulation of summer pruning and training, it must now be done.

This work should be commenced in the beginning of the month, and followed with the utmost diligence till the whole be completed; for were these trees suffered to remain long in the wild confused manner, that they naturally grow into at this season, it would not only prove detrimental, in a great degree, to the trees, but would also very much retard the growth and ripening of their fruit.

Therefore let these trees be gone over, taking care to clear away all ill-grown and ill-placed shoots; for this will not only strengthen, but make more room to train the useful shoots in a proper manner to the wall.

In doing this, select a plentiful supply of all the best growing well-placed shoots, to retain in all parts where they can be trained in regularly; prune out all the irregular placed fore-right shoots, and others not eligibly situated for regular training, as well as all rank luxuriant of remarkably vigorous growth: cut out, also, any ill-formed, thick, spongy, and other improper and apparently useless wood, and where the general shoots are over-abundant, cut away the worst of the superfluous, in a regular manner, so as to leave plenty of the best in all parts of the tree; and let all the others, as above, be pruned quite close to the places whence they originate.

At this season, it will be proper to observe, that where there are any vacant spaces, it is now a most eligible time to begin to furnish the requisite supply of wood in such parts, the same year, by pinching or pruning short some contiguous young shoots.

For example, if two, three, or more branches may be wanted to fill the vacancy, and suppose there be only a young shoot produced in or near that place, it will, in such case, be proper,

in the first or second week of the month, to shorten the said shoot or shoots, to three, four, or five eyes, according to their strength: and by this practice each shoot will send forth two, three, or perhaps four lateral shoots the same season, to fill the vacancy.

The above method of shortening the young shoots of the same season, may likewise be practised on young trees, to procure a supply of branches to form the head of a proper expansion as soon as possible.

STRAWBERRIES.

The strawberry-beds must be duly supplied, in dry weather, with water, as the plants will now be in blossom, and the fruit setting and advancing in growth.

The waterings should, in a very dry time, be repeated every two or three days, from the beginning till about the middle of the month; for about that time, the principal crop of most kinds of strawberries will be about setting and swelling to their respective sizes: and while the fruits are taking their growth, the plants should be encouraged, by keeping the earth in the beds always moist in a middling degree, and the advantage will plainly appear in the size, as well as the quality of the fruit.

DESTROYING INSECTS.

Continue assiduously to destroy every species of insect on their first appearance, particularly the red spider and green fly, which, if dry weather take place, will be in great abundance; the garden-engine and fumigation will, as already noticed, keep both under.

BUDDING.

This operation may be commenced on some trees this month, and continued until August. (*See next month.*)

VINES.

Vines on the walls should be attended to, and regularly pruned, and their shoots laid in, according to circumstances. Few insects injure the vine on the open wall. The red spider is its greatest enemy, but it may always be kept under by a plentiful supply of water, administered with the engine. The thrips sometimes attack them on the walls, but most generally on those leaves or shoots, which have been injured by frost. Fumigation will rid the vine of this enemy, as well as of the fly. Some of the turtle insect sometimes visit the vine, but we have never observed them commit any other injury, than causing a mucilaginous substance to fall on the leaves, which, in a certain degree, is injurious to them. They are to be destroyed by being rubbed off, which, on account of their size, is no difficult matter. The species of this genus, which visit the vine, are the *Coccus hesperidum* and *Coccus ciadonidum*.

PRESERVING FRUITS FROM BIRDS.

Cherries on wall, and standard trees should be protected from birds, by means of nets. They should be put on walls, as recommended for screening the blossoms, that is, so far as regards setting them out properly with sticks from the wall. Standard-trees may be secured by covering the top of the tree with a large net, and securing it at the bottom.

Cherries are sometimes cultivated in an inclosure by themselves on dwarf-standards, and in this way they are easily preserved from the attacks of birds, by securing them by means of nets. In some parts of the Netherlands, regular cherry-gardens are formed, and are secured from birds by similar means. In some parts of England, cherry-grounds are enclosed with high wire fences, sufficiently fine to prevent the birds from getting in, and secured over the top by means of large nets, which are supported sufficiently high to allow the trees to attain their desired height; underneath these trees, which are regularly trained dwarf-standards, strawberries, currants, and gooseberries, are planted, which, being protected from birds, remain long on the plants, after all the fruits

of the same sorts are over in the garden, with the exception of those which are matted on north walls.

Strawberries should now be protected from birds by means of nets. If planted in the common way, in open quarters of the garden, they may be preserved from them by spreading nets over the beds, and supporting them from the ground by small sticks, about a foot or eighteen inches high; these to be taken off and replaced after each gathering. This is attended with some trouble, but it often happens that small birds and wood-pigeons will destroy the crop, unless some such means be taken for their preservation.

In damp weather, look over the strawberry-beds, and pick up the slugs, which will be otherwise very destructive to them. Net up such raspberries, currants, and gooseberries, as are planted on south walls for early crops, for they are more likely to be destroyed by birds than they otherwise would be, if plenty of ripe fruit were in other parts of the garden; without this precaution, a great disappointment may arise, in having those fruits fit for the table at an earlier season, than that at which the principal crops come in.

SUMMER PRUNING SMALL FRUITS.

The summer pruning of gooseberries, currants, and raspberries, has been hitherto little attended to, although it has been found highly useful. At this season, all young wood, that would otherwise be left on the bushes until winter, and then pruned off, should be displaced; if done in May, or the beginning of this month, it will benefit the plants, as well as the fruit; the nourishment, which it would require to support them, will then be thrown into the useful shoots and fruit. A free admission will also be obtained for the sun and air to improve the fruit, and when ripe will be gathered with greater comfort, particularly the gooseberries. The trees on walls, or trained on espaliers, should also be examined, and thinned of all useless wood; and such as is really useful trained into the wall, or rail. The bushes, on the appearance of the *Phalænæ grossularia*, the *Aphis ribes*, and the caterpillars of the *Papilio* genus, should be well scourged with the garden-

engine, in which lime-water or water alone may be used. But no method is so effectual, as picking them off with the hand, as already recommended.

WATERING WALL-TREES.

Continue to operate with the garden-engine on all kinds of fruit wall-trees, except such as are advancing to maturity, and apply the water with force for the destruction of insects, and for refreshing the trees: this operation should now be always performed in the evening, that the effects of the water may act for a longer time upon the trees.

The expense of this operation in most gardens, where water has not been laid on, as recommended in the early part of this work, and practised by Hay and other eminent garden architects, deters many from this useful branch of fruit-tree culture; and others neglect it, thinking that what the trees receive from rains and dews should be considered as sufficient. Let those persons, however, for a moment reflect, that a tree planted against a wall and constrained to it often in the most unnatural position, deprived of the perpendicular dews and rains by projecting copings, and exposed to a powerful sun, the rays of which are reflected from the wall, so as considerably to increase the temperature above that of a tree growing as a standard, must require to be supplied with water artificially, with as much reason, and on the same principle, as those plants which are reared under glass.

J U L Y

BUDDING.

Almost all the more valuable kinds of fruit-trees are increased in this way, as well as many shrubs and plants.

This is one of the methods by which the different approved varieties of many kinds of fruit and other trees can, with certainty, be continued and multiplied; for, though their seeds readily grow and become trees, yet from the seeds or kernels of the finest varieties of fruit, not one tree out of a hundred produces any like the original, and but very few that are good; so variable are seedling fruit-trees, and many others; but the trees or stocks so raised, being budded or grafted with the proper sorts, the buds or grafts produce invariably the same kind of tree, fruit, flowers, &c.

This mode of propagation is particularly useful for peaches, nectarines, apricots, plums, and cherries; the three former of which succeed better by budding than grafting, and are usually worked upon plum-stocks raised from seed, and sometimes by suckers, layers, and cuttings. They are also often budded upon their own stocks, or such as have been raised from the kernels of these kinds of fruit; but they are commonly more strong and durable when budded upon plum-stocks.

There are also other sorts, as plums and cherries, which are often propagated by budding as well as grafting: the cherry is, however, generally the most prosperous by the latter method, as being more apt to gum and go off by budding. These sorts, being of the same genus, grow well upon stocks of each other, but best upon their own stocks.

Apples and pears are, likewise, capable of being propagated by budding as well as by grafting; though, as they grow freely by grafting, which is the most easy and expeditious mode, they are commonly propagated in that way.

In short, most kinds of fruit-trees, and others, propagated by grafting, also succeed by budding. Grafting is, however, more adapted to some sorts, and budding to others.

The operation of budding, in all sorts, is mostly performed on young trees raised from seed, suckers, layers, &c. which are termed stocks, and which, when about half an inch thick in the bottom of the stem, are of a proper size for budding on, although it may be performed upon stocks much smaller. It is also practised on trees that already bear fruit, when intended to change the sorts, or to have different sorts on the same tree, or to renew any particular branches of a tree; performing the operation on young shoots of the year's, or of one or more year's growth. This is the most suitable time for beginning this operation, although, in some cases, it may be done successfully sooner; but from the middle of this month till the end of August is the most general season. When buds are put in too early, they are apt to spring the same season, and not having time to harden or ripen, are often destroyed in winter. The buds should always have finished their spring growth, and come off readily in the operation. The buds should be taken from the young shoots of the same summer's growth, and, like grafts, should be cut from the most healthy trees intended to be propagated. A number of the best and moderately strong shoots should be cut each day, as they are wanted, and as they are collected, all the leaves should be cut off, with about a quarter of an inch of their foot-stalks only left, trimming off also the spongy soft ends of the shoots; they should then be covered from the air and sun, and taken as wanted; and as each cutting furnishes many buds, they should be cut into pieces about an inch and a half long, as they are inserted into the stocks. Those buds in the middle part of the cuttings are preferable to those towards the ends.

It is the common practice to insert one bud only in each stock; but some place two, one on each side, opposite each other.

The proper height at which to bud the stocks varies according to circumstances. For dwarf-trees intended for walls and espaliers, &c. they should be budded from within about three to six inches of the bottom, that they may at first furnish branches near the ground. For half-standards, at the height of three or four feet; and for full-standards, at from five to six or seven feet height; the stocks being trained accordingly. For half and

full-standards, the budding may, however, if necessary, be performed as low in the stock as for dwarfs, and the first shoot from the bud trained up to a proper height for a stem.

The proper apparatus for budding are, a small knife with a flat thin handle, for preparing the stock and buds for insertion, and opening the bark of the stock, to admit them, and a number of new bass strings to tie them, which should be previously well soaked in water to render them more tough.

As in this operation, the head of the stock is not cut off, as in grafting, but left entire till the ensuing spring, and then cut off, a smooth part on the side of the stock, at the proper height, rather on the northward side, away from the sun, should be chosen for the insertion of the buds. This should be done by making a horizontal cut across the rind of the stock, and from the middle of that a slit downwards about two inches in length, so that it may have the form of the letter T, being careful not to cut too deep, lest the stock should be wounded; then having cut off the leaf from the bud, leaving the foot-stalks remaining, a cross cut should be made about half an inch below the eye, and the bud slit off, with part of the wood to it, somewhat in the form of an escutcheon: after this, that part of the wood which was taken with the bud should be separated, taking care that the eye of the bud be left; all those buds which lose their eyes in stripping, are useless; then gently raise the bark of the stock, where the cross incision was made, with the flat handle of the knife clear to the wood, and thrust the bud into it; placing it smooth between the rind and the wood of the stock, cutting off any part of the rind of the bud, which may be too long for the slit made in the stock; and having thus exactly fitted the bud to the stock, tie them closely round with bass mat, beginning at the under part of the slit, and proceed to the top, being careful not to bind round the eye of the bud, which must be left open and free.

Although it be the ordinary practice to divest the bud of that part of the wood which was taken from the shoot with it, yet in many sorts of tender trees, it is better to preserve a little wood to the bud, without which they often miscarry. This has occasioned some to imagine that some sorts of trees are not capable of being propagated by budding.

After the buds have been inserted three weeks or a month, they should be examined, to see which of them have taken; those which appear shrivelled and black, being dead, but those which remain fresh and plump have joined. At this time, the bandage should be loosened, which, if not done in time, is apt to pinch the stock, and greatly injure, if not destroy the bud.

In the following March, cut off the stock about three inches above the bud, in a sloping manner, that the wet may pass off, and not enter the stock; the shoot which proceeds from the bud, which would otherwise be in danger of being blown out, may be tied the first year to the part of the stock left above the bud; after which it should be cut off close above the bud, that the stock may be covered by it. Some, however, think it a better practice to cut it close at once.

After this, the whole effort of the stock is directed to the inserted buds; they soon push forth strong, one shoot from each; many shoots also arise from the stock; but these should be constantly rubbed off as often as they appear, that all the powers of the stock may be collected for the vigor of the bud-shoot, from which now commences the tree, and by the end of summer is, in some sorts, advanced three or four feet high; and in the autumn or spring following, the young trees may be transplanted into the places where they are to remain, or they may be kept longer in the nursery, according to the purposes for which they are designed.

Shield-budding reversed, differs from the former, in having the transverse cut made at the bottom of the perpendicular slit, instead of its top, and of course the shield is reversed in its position. This mode is sometimes practised, and is preferred to the other by those who contend that the sap rises in the bark equally with the wood; but as this opinion is on the decline, shield-budding is not much used. It is sometimes practised in the orange-nurseries, near Genoa, as may be seen by orange-trees imported from that country.

Scallop-budding, is performed on trees having a thick hard bark, and is also sometimes done when the bark and wood do not readily separate. It is performed by taking a thin tongue-shaped section of bark from the side of the stock, and in

taking a similar section from the shoot of buds, but in neither case removing the wood. The section or shield, containing the bud, is then laid on the corresponding scallop in the stock; its upper edge exactly fitted as in shield-budding, and at least one of its edges as in whip-grafting. After this, it is tied in the usual way. This sort of budding may be performed in spring, or at any season. The French gardeners often bud their roses in this manner in spring, and if they fail, they have a second chance in July by using common shield-budding. Its disadvantages are, that it takes longer time to perform the operation, and is less certain of success.

The late professor Thouin enumerates no less than twenty-three species and varieties of budding, but of these, none are in practice in this country but the three already described; and of these, the first, or common shield-budding, is the most common in use. Budded trees are generally two years longer in producing their fruit, than grafted ones; but the advantages of budding is, that where a tree is rare, a new plant can be got from every eye, whereas, by grafting, it can only be got from three or four eyes. When grafting has been omitted in spring, then budding comes in, as an auxiliary, in summer. Mr. Knight has transferred blossom-buds from one tree to the barren shoots of another with success. However, he does not consider this to be of much utility, but merely a curious experiment.

GRAFTING FRUIT-TREES.

A variety of saddle-grafting is practised in many parts of Herefordshire, and is not done till this month, or the latter end of the former. It is practised on small stocks, at the time the bark is most readily detached from the alburnum. The head of the stock is taken off by a single stroke of the knife obliquely, so that the incision commences about a diameter of the stock below the point, where the *medulla* appears in the section of the stock, and ends as much above it on the opposite side. The scion, which for this mode of grafting should not exceed in diameter half that of the stock, is then to be divided longitudinally about two inches upwards from its

lower end, into two unequal divisions, by passing the knife upwards, just in contact with one side of the medulla. The stronger division of the scion is then pared thin at its lower extremity, and introduced, as in crown-grafting, between the bark and the wood of the stock, and the more slender division is fitted to the stock upon the opposite side. The scion, by this means, stands astride of the stock, to which it attaches itself in a very complete manner, and covers the top of the stock in one season. Apples and pears grafted by this method seldom fail, and may be practised with equal success with young wood of this year's growth, as soon as it becomes moderately firm and hard.

VINES.

Vines should be now looked over again, in order to clear them from such shoots as have been produced since last month. In vines, many small shoots generally rise, one mostly from every eye of the same summer's shoots which were laid in a month or two ago; and the same small shoots must now, as they are produced, be all displaced, to admit all possible benefit of the sun and free air to the advancing fruit.

All other shoots, wherever placed, that have been lately produced, must also now be rubbed off close; and such shoots as shall rise any time this month, should, accordingly as they come out, be continually taken off, except where good sizeable shoots advance in or near any vacant parts where a supply of young wood appears necessary; in which case, it is proper to retain them, and have them trained in regularly.

WALL-TREES.

Where wall-trees have not yet had their summer pruning, that very needful work should be done in the beginning of the month; otherwise, the fruit upon such trees will not only be small and ill-grown, but be greatly retarded in attaining maturity, and will be also of very inferior flavor. Independently of retarding the growth and spoiling the taste of the fruit, it is also detrimental, in a very great degree, to wall and espalier trees, to

neglect the summer pruning and the entire nailing till this time; particularly to apricots, peaches, nectarines, and such trees as produce their fruit principally upon the one year old shoots. It also causes great perplexity to the pruner, to break through and regulate such a thicket and confusion of wood, requires treble the pains and labour, and cannot be executed with such accuracy, as when the work is commenced early in the summer.

There is a very great advantage in beginning early in the summer to train the shoots in a proper direction; and, at the same time, to clear the trees from all ill-placed, luxuriant, and superfluous shoots; for when the useless wood is timely cleared out, and the useful shoots laid in closely and regularly to the wall, the sun, air, and gentle showers, will, during the whole time, have proper access, not only to promote the growth and improve the flavor of the fruit, but also to harden or ripen the shoots properly, which is absolutely necessary to their producing good fruit and proper wood next year.

Do not shorten any of the shoots at this time, but let every one be laid in at its full length, where room admits. Look also again over such wall and espalier trees as were pruned and nailed the last two months; and see if all the shoots then laid in, keep firm in their places; and where there are any that have been displaced, are loose, or project much from the wall, let them be now nailed in again close in their proper position.

Likewise observe if there have been any straggling shoots produced since last month, in places where not wanted, and let them now be displaced.

FINAL THINNING OF WALL-FRUITS.

The stoning of peaches, nectarines, apricots, and plums, will now be over, and all danger of their casting their fruit at that precarious season be past. They should now be thinned out nearly to their respective distances, leaving, however, a few more than enough to be picked off occasionally, till towards the end of this month or the beginning of next, for fear of accidents. Sometimes many will drop off between their stoning, and their taking their first swelling, as it is called; but all

thinning should be completed before they take their last swelling, for if delayed longer, it will be too late. With respect to the quantity or number proper to be left on a tree, much must depend on its size and strength, and whether it be an established tree, or still in training. All healthy trees are to be allowed to carry a greater quantity than those in a debilitated state; young trees still training, unless very gross indeed, should also be well thinned of fruit, else their progress in filling their allotted share of the wall or pales will be prevented. Very luxuriant trees, however, may be allowed to carry a larger crop to correct their gross habits; and this, if judiciously done, will bring them into better wood than any system of pruning that can be adopted. On the larger sorts of peaches, apricots, &c., in a healthy full-bearing state, one fruit for every square foot of surface may be taken as a good medium. That is to say, that a tree occupying a space equal to one hundred square feet should be allowed to ripen one hundred fruit; the smaller sorts may be allowed to ripen one-third more, according to their size and the health of the trees. Plums should be thinned to a reasonable extent, and not be allowed to touch each other if on spurs; and if on young wood, and of the larger sorts, to be full six inches apart. Few gardeners have resolution to thin sufficiently, all being ambitious of large crops; but by thinning, that which is lost in number is more than made up for in weight and quality. It is a just observation of a very intelligent gardener, that "every one ought to thin his friend's trees." The effects of thinning can, like most other operations in gardening, only be discovered by comparison. Let, therefore, one tree be thinned as above, and another only half as much, and it will be found, that the tree fully thinned will produce a greater weight of fruit, and be incomparably more beautiful and higher in flavor. Apples and pears, particularly the finer sorts, should be thinned, and the result will be obvious. They should be thinned when about half grown, at a time when all chance of their dropping off is over. It is not going too far, to say that all small fruits, gooseberries, currants, raspberries, and even strawberries, should be thinned. These should be thinned with sharp-pointed scissars, such as are used for thinning grapes. The best cul-

tivators of these fruits thin them very much. Nothing tends more to keep fruit-trees in good health than a regularity in their crops, and this should always be done some time before they swell off for ripening; for if delayed till they be nearly full grown, the mischief is in a great measure done, both to the tree and to the fruit that is left.

WATERING WALL-TREES.

This important business should be persevered in, to all trees, excepting those which are ripening their fruit; from these it must be withheld until the fruit be gathered, when one or two good waterings with the engine should be given.

DESTROYING INSECTS ON FRUIT-TREES.

Continue assiduously the destruction of insects of all sorts that infest the fruit-garden. Wasps will now be getting strong, if care have not been taken to destroy them as they appear. The most effectual method to destroy them is to find out their nests, and at night introduce a squib made of gunpowder, which will stupify them; or brimstone-smoke introduced will have the same effect, but it is not so readily forced into the remote parts of their subterraneous habitations, as that of gunpowder. For the more effectually carrying this work into execution, give rewards to boys, and the operatives of the garden, for each nest destroyed within a mile of the garden, and let each nest so destroyed be brought to the gardener, or whom he may appoint, to see that it is done in a proper manner. Boys will discover the nests in the day-time, and at night, when all the enemy are encamped, fire the train, and their destruction follows in a few seconds, not one of them escaping. When the squib is fairly introduced, put the foot, or a piece of turf, on the hole, to prevent the escape of the smoke, which after having been a few minutes in the hole, dig up the nest with a spade, and pour plenty of water upon the whole, which work up into a complete mortar, with the spade; or else gather up the whole, and carry it to the garden for examination. A diligent attention to this practice will, in a couple of seasons, clear a distance of two miles round the garden entirely from these destructive creatures. Phials half filled with any sweet

liquid, hung up in the trees amongst the fruit, will destroy many, whilst a number may be destroyed during the time they are buried in the fruit, which they excavate quite hollow, and are so intent upon the fruit, that they will scarcely come out of it. They are most voracious, and will devour a vast quantity of fruit daily. The pieces of meat which they have been observed to carry off from a butcher's stall is truly astonishing. They are furnished with a natural saw-like proboscis, which they are very expert in using to cut off such pieces of fruit or meat as they choose. Oil is fatal to all insects when dropped upon their backs; it closes up the pores by which they breathe: this may be readily applied to them while half buried in the fruit.

The *Ear-wig* (*Forficula*) and *Wood-louse* (*Oniscus*) will now prey upon the ripe fruits, and should be destroyed by placing bean-stalks (which contain a sweetness within, of which they are supposed to be fond) or other hollow substitutes for them to retreat into during the day, as both, for the most part, commit their depredations in the silence of night; and if these be examined every morning, and the insects they contain blown out, they may be readily destroyed.

Slugs will also now ascend the walls in cloudy weather, and secrete themselves behind the larger branches, and in the holes of the wall, and will commit sad havoc upon wall-fruits, particularly nectarines, even in an unripe state; they will strip them of their skin, and sometimes eat them up altogether; a strict search should be made for them every day, and no part of the wall left unexamined; a close attention for a few days will rid the trees of them, and no method so good as carefully hand-picking them.

A very infallible trap for these depredators is to make small thimble holes, about an inch in depth, near the plants attacked; into these holes the slugs are certain to retreat during the day, where they may be destroyed by sprinkling a little quick-lime into the holes. We have always found the use of barilla to be an efficacious method of killing these vermin. If a person were to go over his garden early in the morning, with a little bag of barilla, and sprinkle a little on every slug and snail, their immediate death will ensue.

AUGUST.

WALL-TREES.

Wall-trees still demand attention; particularly peaches, nectarines, and such like.

Let them be once more carefully looked over, and see whether all the branches and shoots remain secure in their proper places. Where any have been displaced by winds or other accidents, let them be nailed up again in a secure and neat manner; and where any of the shoots are loose, or project from the wall, or have extended in length, let the whole be nailed in securely.

To have the shoots all lie close and regular to the wall is a great advantage to the fruit, and is beneficial to the trees, and always looks well.

As the fruits, particularly peaches, nectarines, apricots, and the finer plums begin to color, the leaves should be picked off that overshadow them, in order to allow the full power of the sun to reach the fruit, which will both add to its flavor and color. In doing so, care must be taken not to pick them off too close, so as to injure the buds; in most cases, if they be cut off about the middle, or within an inch or two of their base, the buds will not suffer much, and many may be placed aside, and will not require to be taken off at all.

FIG-TREES.

Fig-trees will now require great care; their fruit will be full grown, and begin to ripen, and will require a moderate degree of the sun's heat to forward them, and to give them their real flavor.

All strong shoots should be laid close to the wall, but use the knife as little as possible.

Let no shoots be cut off except those which grow foreright; and such as grow in a proper position should be carefully

trained, for those which are now laid in, are the shoots from which the fruit is to be expected next year. And as these trees bear no fruit except from the one year old shoots, it is best to leave a sufficiency at this time, as it will be very easy to prune such away (at the general season for pruning) as are not wanted.

Let them be laid in regularly, not one across another, and secure them properly, for, on account of the broadness of the leaves, the winds and rain have great power over them.

NEW-BUDDED TREES AND BUDDING.

Go over the stocks or trees which were budded in July, and let all the bandages be loosened.

This should generally be done in about three weeks, but never exceed a month, after the budding is performed; otherwise, as the bud will swell, the sap will be stopped in its regular course, and the parts about the bud will be pinched, and swell irregularly.

Likewise in trees budded last year, now advancing in their first shoot, examine that part of the stock below the inoculation; and where there are any shoots sent forth in that place, let them be taken off close.

Budding may still be performed, and will be successful, in most sorts of stone-fruit, as peaches, nectarines, apricots, plums, &c.; but this must be done in the beginning, and not later than the middle of this month.

CLEARING FRUIT-TREE BORDERS.

Let all fruit-tree borders be now kept clean and free from weeds of any kind whatever, and let no litter be seen on any parts thereof.

These borders, when kept clean, have not only an agreeable appearance to the eye, but have a very beneficial effect on the fruit, by reflecting the heat on the fruit, and thereby ripening and greatly improving their flavor.

GATHERING FRUITS.

Many sorts of wall and standard fruits will now be ripe, the gathering of which is an important part in the practice of gardening, and one to which sufficient attention is seldom paid. It is a common practice to allow most fruits, when ripe, to fall of their own accord; and, in order to prevent the injury they may sustain, many plans have been adopted, such as covering the borders at the bottom of the walls with moss, or suspending nets and mats for them to fall into. Fruits left upon the trees till sufficiently ripe to fall of their own accord, are much too ripe, and consequently have lost much of their flavor; besides, however good the precautionary measures may be, still many are so much bruised as to be unfit to keep many days, and often not many hours. It is, therefore, much better to watch their ripening, and carefully to gather them as they arrive at full maturity, and this is to be ascertained by a close acquaintance with their natures and sorts. There are certain criteria to be fixed upon, by which we may know, with great nicety, when certain fruits are in a proper state to gather. Most fruits part freely with the tree when ripe, particularly the plum; they should not be much handled, as the bloom is apt to be rubbed off. Apricots may be accounted ready to gather, when the side next the sun feels a little soft upon gentle pressure with the finger. They adhere firmly to the tree, and would remain upon it till over ripe and mealy. Peaches and nectarines, if moved upwards and allowed to descend with a gentle jerk, will separate from the tree, if ripe. Figs are generally ripe when the small end assumes the same color as the larger. Apples and pears begin to fall naturally, when ripe. Another and more easy mode of ascertaining the ripeness of fruit, is to move the fruit up level with the foot-stalk, if ripe, it will readily part from the tree. Another criterion is to cut up a fruit of the average ripeness of the crop, and if its seeds have become brown, or blackish, it is ripe; but if it still remain white, it is not ripe. Much has been said of fruit-gatherers, &c., but the safest mode is to determine the fact of ripeness by some of the above-mentioned criteria. Fruits

may, for some time, be retarded in their ripening on the trees; currants, and some thick-skinned gooseberries, may, by covering, be retarded till Christmas. Peaches and nectarines may, by the same means, be kept hanging on the trees for a fortnight after they are ripe. This, to a certain degree, injures their flavor, but it is often found necessary in order to suit the arrangements of the owner. Peaches, and other tender fruits, may be kept for some time, if gathered before they are fully ripe, and placed in boxes in a cold cellar or ice-house; and fruits even gathered in the morning, if placed in the ice-house, are supposed to be improved in flavor when sent to the table in the afternoon.

During the season of the finer fruits, the walls should be gone over once at least, if not twice every day, and all ripe fruit gathered carefully by hand, bruising it as little as possible, and carefully laying it in a flat level-bottomed basket, which should be carried by a second person. The bottom of the basket should be covered with some fine dry moss, *Hypnum* or *Sphagnum*, and over it a sheet or sheets of clean paper, upon which the fruit should be carefully placed in rows, and steadily carried along until the whole be gathered, or until the bottom of the basket be covered; but in no case, particularly when gathering peaches or nectarines, put more in one basket than what will cover the bottom. Carry this basket to the fruit-room, and, to prevent an unnecessary handling of the fruit, leave them in the basket until wanted for use. With another basket, or baskets, according to the quantity to be gathered, proceed again until the whole be collected. But where there are a number of trees, and the quantity of fruit great, the best only should be thus carefully collected, and another basket should be carried, into which all such as may have fallen, or be in any way injured, should be placed, and these also should be carried to the fruit-room till wanted for the kitchen, for stewing or other culinary purposes, or otherwise disposed of as may be desired. All other fruits should be collected according to this manner. Such as are much destroyed with wasps and other insects should be left on the ground, or stuck on the trees, as while they last, the insects will not attack the other fruit; they will act as baits for them

at the same time, and should be looked to frequently, and as many of the insects killed as possible. Notwithstanding this care of gathering them daily, many will fall, but in order to save them as much as possible, it will be advisable to have either mats or nets suspended for them to fall into; it will save many from being dashed to pieces, or so bruised as to be unfit for use. At that season, when peaches, nectarines, apricots, and plums most abound, the supply should be given in for preserving and such like uses, in order that when the later sorts come in, the demand may not be so great for them for the dessert, as to be attended with inconvenience to the gardener to spare them. This ought to be considered of all fruits while they are in plenty, in order to avoid disappointment and unpleasant altercations.

Jargonelle, bergamots, and other pears; jennetting, summer pearmain, and other apples, which ripen in July and August, should be eaten from the tree, or within a few days after they are pulled; they should not be allowed to drop, and they lose much of their flavor by keeping. When gathered, they should be laid upon the shelves of the fruit-room, laying paper under them; but on no account lay them upon moss, hay, or brown paper, either of which will give them a bad flavor; neither should they be laid in heaps, nor too closely together, but should be laid out quite separate and distinct, so that they will not even touch each other. Free air should be admitted at all times into the fruit-room at this season, and in damp weather, a gentle fire should be kept up, in order to dry any damp that may have arisen in the room. Cherries and plums should for the most part be gathered from the trees, as should be all small fruits, and as soon before they are used as possible, as they lose their flavor by keeping.

PACKING FRUIT FOR CARRIAGE.

Fruit sent to any distance should not be packed in baskets, as it is liable to be injured by being bruised. Boxes of tin or deal should be used for this purpose, and of sizes according to the quantity to be sent. These boxes, if of wood, should be made of inch deal, and secured at the corners with iron

clamps, and secured with locks, each lock having two keys, one to be kept by the person who packs the fruit, and the other by the person who unpacks it. These two keys to answer the locks of all the boxes. In packing the fruits, the heaviest and largest should be put in the bottom, and the lightest and more delicate on the top. Thus, melons, apples, and pears, should be put in the bottom, each wrapped up in a separate piece of clean paper, and packed in amongst clean well-dried moss; species of *Sphagnum* or *Hypnum* to be preferred; over them may be packed peaches, apricots, plums, and grapes, each first wrapped up in vine leaves, and over them a piece of clean paper, and laid level in, and packed tightly with moss. Strawberries, gooseberries, currants, and raspberries, should be put into shallow tin boxes, each sort separately, and packed in the larger box beneath the peaches and grapes. In packing, observe to lay the fruits in regular layers, and between each layer a course of moss; continue this till the box be full, which should be made up with moss, if there be not a sufficient quantity of fruits to fill it, to prevent any friction amongst the fruits. The lid should be then secured down with a lock, but not with nails, for the difficulty of getting them out would shake the fruits too much. The moss should always be returned in the boxes, which, if kept dry and well aired, will generally last all the season.

DESTROYING INSECTS ON FRUIT-TREES.

Continue the destruction of all insects on fruit-trees. As many fruits will now be ripening, the use of the garden-engine must be suspended. If it has been freely used, as directed hitherto, there will be no fear of the red spider, or any other of the smaller insects, doing much injury. Slugs will, in wet weather, be both numerous and destructive; they must be, as has been already directed, picked up wherever they appear; and the destruction of wasps and large black flies should be regularly attended to, both of which will make sad havoc amongst the finer fruits at this season.

COVERING UP TO RETARD SMALL FRUITS.

Red and white currants, and Morella cherries, planted on north aspects should, as they ripen, be covered up with nets to protect them from birds; and many of the currant-bushes may be covered with large garden-mats, which will preserve them till a late period. The late and thick-skinned gooseberries, red and white currants, in quarters or rows round the sides of the walks, should be examined, and such as are best loaded with fruit should be covered up with mats or nets. Where these fruits are planted in lines in the quarters of the garden, a quantity of wattled hurdles will be found extremely useful for this purpose, placing a row of them along both sides of the bushes, about two or two and a half feet distant at the bottom, and brought together at the top and tied with cords, placing each hurdle close to the other, so as to exclude birds from getting in. In such places, as it is likely that they will get in at, a few small branches of spruce, or other thick-growing trees, should be drawn in, so as to thicken them sufficiently. The ends of each row should be secured with a piece of mat. At any time that birds should get in, they can be easily killed or driven out, by opening the end mat and beginning at the other, with a small stick drive them out. This mode of preserving small fruits we have found to answer much better than any other; for if the bushes were summer pruned, as already advised, a freer circulation of air passes among the bushes, and prevents the fruit from moulding and spoiling, which it is very apt to do when covered with mats; and the expense of hurdles is much less than that of mats, and can be, if taken care of, made to last for several years, and are extremely useful for many other purposes in the garden, such as shading newly-planted crops in sunny weather, and for protecting early spring crops from the effects of frost, &c.

PLANTING STRAWBERRIES

Strawberries may now be planted. The strongest plants should be chosen, and if the roots be well puddled before planting, and a good watering given as soon as planted, they will soon strike root, and be established before the approach of winter.

SEPTEMBER.

PEACHES AND NECTARINES.

These fruits will now require particular attention, many of them will be ripe and ripening. The use of the engine should now be withheld, until the crop be all gathered. Any shoots that may have been displaced from the wall by winds or otherwise, should be neatly nailed in, and all useless and ill-placed shoots taken off. Where leaves hang over, and overshadow the fruit, they should be taken off, as directed last month, so that the fruit may derive all possible benefit from the sun, both to improve its flavor and color. As most fruits swell best when not too much exposed to the sun, this picking off of the leaves should not take place until they show symptoms of ripening; the influence of the sun for a few days will be sufficient to effect the desired object. In gathering such as are ripe, attend to the instructions given last month.

VINES.

The vines on the walls should be looked over, all useless lateral shoots pinched off, and all straggling branches nailed in closely to the wall, both to allow the sun getting in to the fruit, and also to ripen the wood for next year. Where the bunches are too much shaded, some of the leaves should be picked off, but in doing so, take great care not to overdo it; leave the whole or most part of the foot-stalk of the leaf attached to the wood, and take as few as possible away, as the vine suffers much from the loss of its leaves. Any shoots that were not shortened before, should be now done, to allow as much light as possible to the fruit and to avoid confusion. The earlier grapes on favorable situations beginning to ripen, should have the benefit of the sun as much as possible, and if the wasps or birds attack them, they should be protected from both by being put into thin crape, or gauze bags, putting one

bunch only in each, and having the bags made of different sizes for that purpose. Such grapes as are not so forward, should be thinned out for good; it is of much importance that this be done in time; and also let them be well thinned to allow them room to swell, and the sun to ripen them.

APPLES, PEARS, AND OTHER TREES UPON WALLS.

These trees should be examined, and where required, all young or loose shoots carefully nailed to the wall, and, as directed for peaches and nectarines, those leaves which shade the finest fruit should be taken off, and all useless wood cleared away to prevent shade and confusion. Such of these fruits as are ripe, or ripening, should be carefully gathered when fit, choosing the middle of the day, when the sun has dried up all moisture, and carefully, without bruising them, removed to the shelves of the fruit-room, and there laid on sheets of clean printing paper. Never use for this purpose either coarse brown paper, or hay, or moss, for all communicate an unpleasant taste to the fruit. The room should be kept well aired, in fine weather by admitting a free current of air through it, and in damp weather, by having a fire occasionally in it. The fruit should be occasionally turned over, and all that show any symptoms of decay entirely removed.

FRUITS UPON ESPALIER AND STANDARD-TREES.

The espalier-trees should be regulated exactly as if they were on walls, and the standards, where it is convenient from their height to be easily got at, should be also thinned of superfluous wood and leaves, to allow the action of air and sunshine to pass freely to the fruit, as well as to disencumber the trees of all useless wood, which will take much nourishment from the fruit and more useful wood. Such of the fruits as are ripe should be carefully picked and laid by, as directed above. For further directions for storing fruits, see *next month*.

DESTROYING INSECTS UPON FRUIT-TREES.

Never lose sight of this object, even when the crop is gathered. Therefore, when a tree gets disloaded of its fruit, resume the use of the garden-engine with great force upon them, particularly apricots, peaches, and plums. The red spider will often begin to show itself again, having, from the respite gained, while the fruit was ripening and ripe, gained considerable strength. The destruction of this very formidable enemy, by destroying at this time his thousands, will prevent his millions from coming forth in spring. The slugs and wasps will now be strong; every means should be adopted to destroy them: the directions given already, if acted upon with perseverance, will subdue them.

PREPARE FOR PLANTING FRUIT-TREES.

Towards the end of this month prepare the ground where new plantations of fruit-trees are to be made. The directions already given on this head, if acted upon, will be sufficient to render any repetition here unnecessary. Many fruit-trees of the earlier sorts will have their wood sufficiently ripened, by the end of this month, to admit of their being transplanted. One advantage will be gained by early autumn planting: the roots will, if supplied with plenty of water, and puddled as already recommended, soon push out fresh fibres, and be so far established before winter, that their change will not be much observed in spring. This is a good season for removing the earlier sorts of peaches and other stone fruits; and, if carefully done, a crop may be expected of them the ensuing spring.

STRAWBERRIES.

Strawberries should now be planted; this season and spring being the best, although under favorable circumstances, they may be planted at almost any other season. They should be copiously supplied with water when planted, and the ground trenched at least two feet deep. As their roots penetrate to

a great depth, the ground cannot well be made too rich for them. Such strawberries as are planted in lines in the fruit-garden should have their runners cut off, and a good quantity of rich manure dug in between the rows, and the ground left as rough as possible. Do not, however, cut off all their leaves, as has been long the practice, as it evidently injures the plants, and leaves the tender buds without any protection during the winter.

CLEARING THE BORDERS ABOUT WALL-TREES.

The fruit-tree borders should be kept neat and clean by repeated hoeing and raking. They should be cropped at this season, chiefly with light crops, such as lettuce, endive, and other salads, which will neither shade the trees, nor exhaust the borders. It is, however, often necessary to have crops of early cabbage, cauliflowers, &c. upon them for protection during winter, and for accelerating their growth in spring. These cannot do any possible injury to the trees, provided that a due proportion of well made compost be added previously to each crop that is calculated to exhaust the ground. Salads will do little injury to these borders, and none at all, if they be previously assisted with a slight compost manure.

DIGGING THE GROUND BETWEEN THE ROWS OF GOOSEBERRIES AND CURRANTS.

The borders and quarters amongst these plants may be dug as soon as convenient, after the crops are gathered; and, if ground be scarce, the intervals between the rows may be cropped with winter spinach, late turnips, or any of the brassica tribe; if cropped with any of these, unless the ground be very rich, give a moderate dunging. If there be no intention to crop this ground, then let the whole be dug, leaving the surface as rough as possible, so that it may be the more fully exposed to the action of the frosts and air.

OCTOBER.

GENERAL CARE OF WALL AND ESPALIER-TREES.

The season of pruning and training these trees is now over, for what is called the summer pruning; and towards the end of the month, that of the winter pruning will be commencing. Those trees which have been disloaded of their fruit, should now be gone over with a light birch-broom, or straight switch or cane, and all the ripe or decaying leaves brushed off. This will greatly forward the ripening of the wood, and the maturation of the blossom-buds for next year. This brushing should be cautiously performed, never brushing much at a time. The shoots from which the leaves are to be displaced should be gently stroked upwards and outwards, but never the reverse way of the buds, for fear of injuring them. Standard-trees exposed to the wind seldom require this care, but as the wind has not the same power on wall and espalier-trees, it becomes essentially necessary.

GATHERING AND STORING WINTER-FRUITS.

Most apples and pears will be fit for gathering from the first till towards the end of the month. This, however, will depend on the season being early or late, and likewise the situation. These fruits, under most circumstances, will be in general ripe by the end of this month. Apples and pears will be fully ripe for gathering when their seeds change from a white to a darker color, and they should be gathered by the hand, and not allowed to fall of their own accord, nor yet to be shaken off the tree by force. They should be picked both from walls, espaliers, and standard-trees, individually, and carefully put into baskets; this, with the convenience of proper

ladders, can be as easily and nearly as soon done as if shaken down by force, and half of them spoiled. The expense of gathering them in this way will be more than defrayed by saving the fruit from bruises. When they are gathered from the tree, they should be carried into the fruit-room, and carefully arranged on the several shelves. The gathering of these fruits should be confined to the middle part of the day, when all damp is dissipated. Examine the trees several times before the operation commences, to determine that all the dew or wet is off the leaves, as well as the fruit. Where the quantity of fruit is considerable, it will be impossible to spread it all out on shelves, neither is there any necessity for so doing. All the more common and less valuable sorts, chiefly preserved for culinary purposes, may, when carefully gathered, be removed to the fruit-room, and laid up in heaps to sweat. This practice is not generally advocated in this century, but the most scientific horticulturists of the last adopted it with success, and we can see no reasonable objection to its being done to such fruits, at least, as are designed for the kitchen. By thus sweating them a little, a quantity of moisture is thereby got rid of, which is, probably, no detriment to the fruit, and must certainly contribute to its keeping.

After the fruit has remained to sweat for a few days, it should be carefully examined, and all wiped quite dry with a cloth, and laid out thinly for a few hours to dry still more effectually, then they should be packed in boxes or hampers, with clean meadow hay, free from must or bad smell, and each sort kept by itself, as they will not all keep equally well. The quantity of hay should be no more than just sufficient to prevent each layer of fruit touching each other; and when the box or hamper is full, let it be correctly labeled with the name, and time to which it is supposed to keep, and then the boxes or hampers should be packed close up to prevent confusion, the later kinds nearest the ground, and those that will be first ready for use on the top. These ought to be examined through the winter, and taken out, and any decayed ones removed, and the whole wiped clean and repacked again, observing to dry the hay, if at all damp, before using it a second time, or substituting sweet fresh hay in preference. The boxes are to be

preferred to hampers, and the closer that they are made the better to exclude air, the better will the fruit keep. They should not be examined until they have been a considerable time in the boxes; this must be determined upon according to the nature of the fruit, whether it be a good keeping sort or not. For the finer kinds of apples and pears, more care should be taken of them, as their quantity will not be so great. Mr. Knight has, in one of his valuable papers, given the following as the most successful mode of keeping the finer apples and pears: "The most successful method of preserving apples and pears which," he says, "I have tried, has been placing them in glazed earthen vessels, each containing about a gallon, (called provincially steens,) and surrounding each fruit with paper: but it is probable that the chaff of oats, if free from moisture, or any offensive smell, might be used with advantage instead of paper, and with much less expense or trouble. These vessels, being perfect cylinders about a foot each in height, stand very conveniently on each other, and thus present the means of preserving a large quantity of fruit in a small room; and if the spaces between the top of one vessel and the base of another be filled with a cement, composed of two parts of the curd of skimmed milk and one of lime, by which the air will be excluded, the latter kinds of apples and pears will be preserved with little change in their appearance, and without any danger of decay, from October till February and March. A dry and cold situation, in which there is little change of temperature, is the best for the vessels; but I have found the merits of pears to be greatly increased, by their being taken from the vessels about ten days before they are wanted for use, and being kept in a warm room, for warmth at this, as at all other periods, accelerates the maturity of the pear. The same agent accelerates its decay also; and a warmer climate contributes to the superior success of the French gardeners, which probably arises only from the circumstance of their fruit being the produce of standard or espalier-trees."

The above is the rationale of Mr. Knight's practice, and exactly agrees in principle with our own, which we have adopted for several years; the only difference is, that we have kept our fruit in strong boxes filled with dry sharp sand, in which the

fruit was packed and secured in a dry room, and as much excluded from the air as possible. By this means, the better keeping apples and pears will keep till April and May, and some will keep till June. However, it is probable that fruits packed in charcoal, or very dry bog-mould, may keep much longer.

PLANTING FRUIT-TREES.

If plantations of fruit-trees be intended, during the next or the succeeding months, it will be now necessary to begin preparing for that purpose; for full directions see the *Planting of Fruit-trees*, and *Preparation of Soils* for them. If it has been a good season, fruit-trees will be fit for transplanting by the end of this month, and for light soils it is the best season in the year.

SMALL FRUITS.

Plantations of gooseberries, currants, and raspberries, where wanted, should be made towards the end of this month. They will be pretty well rooted before winter.

PRESERVING SMALL FRUITS.

The gooseberry and currants matted or netted up should occasionally, in dry days, be uncovered, and all decaying leaves picked off, and every thing removed that has a tendency to produce mouldiness, or rottenness. When they are perfectly dry, mat or net them up again, so as to exclude birds, &c.

NOVEMBER.

PRUNING FRUIT-TREES.

The pruning of fruit-trees of all sorts may be begun this month, excepting figs, and peaches, the wood of which is not yet sufficiently ripe. Where there is much pruning to be done, the standard fruit-trees may be first operated upon, as the majority of them will now be sufficiently ripe for that purpose; and by the time that they are finished, those on the espaliers, and afterwards the wall-trees, may be proceeded with. It is of importance, in extensive gardens, to begin winter-pruning at an early period, that there may be plenty of time to do the whole in a proper manner. In going over standard-trees at this time, if they be old, and much crowded with old spurs, they should be cut out in a regular thinning manner, and all superfluous young wood, that is not wanted to form branches to fill up any vacancy, or to replace any old worn out ones, should be cleared away, and even some of the old branches should be cut out in such a way, as to keep up a succession of young wood in every part of the tree. If this be properly attended to, the trees will remain much longer in a healthy state, than if allowed to grow on without such a provision being made for forming a supply of bearing wood. Trees much debilitated and decayed, should be headed down to within a few inches of the graft or bud, as directed in the spring months; proper ladders and pruning instruments should be used, so that the operation may be performed without injury to the trees.

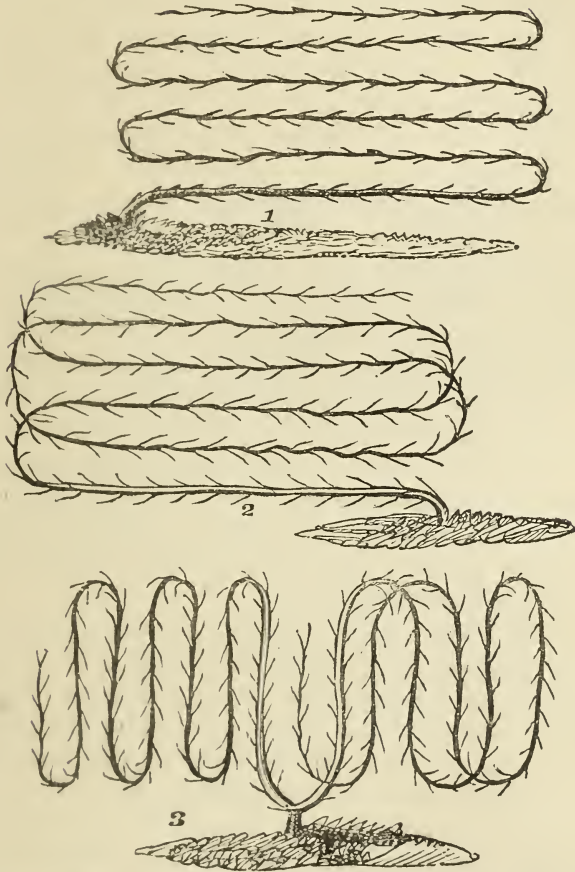
PRUNING AND TRAINING VINES ON THE OPEN WALLS.

It is a general practice to prune vines on the open walls in spring, but as they are apt to bleed much, if that operation be delayed until the sap has risen, we deem it the safest way to perform it in autumn as soon as the leaves have fallen, and the wood is sufficiently ripened, or as soon after as convenient.

Vines on the open walls, in favorable situations, are no unimportant part of the produce of the fruit-garden; and, in situations where the fruit does not quite ripen in ordinary seasons, it is, in its unripe state, of some consequence to the owner, not only for the use of the kitchen, but also for the more important purpose of wine-making.

Vines, under such circumstances, may be trained and pruned in a variety of forms, and fancy may here be more indulged than with such as are in the vinery. As this plant, like some others, produces its fruit on young shoots arising from the wood of the preceding season, it therefore becomes necessary that, that description of wood should be encouraged and equally distributed over the whole tree; and as the vine is apt to become naked, or thin of such wood towards the bottom, particularly under bad management, it is the more necessary to point out the necessity of counteracting that habit by a judicious use of the pruning-knife. However advantageous it may be in the management of vines under glass, to retain the shoots at some length, often of several feet, it is obvious that the same principle is not applicable to those in the open air. The practice of those, who cultivate vineyards for the purpose of wine-making, teaches us that cutting them short is advantageous, even in good climates; it is therefore more so with us in our less congenial one; and the success of those, who with us have carried this branch of horticulture to any extent, bears us out in the assertion. Vines in the open air break more regularly than when forced; therefore there can be no want of fruitful shoots, should the wood of the present year be shortened in at this time, to two, or often, where the buds are strong, to one eye. However, the eye nearest to the old wood is often weak, and less likely to produce a fruitful shoot. Our practice, in such cases, has been to rub off the eye nearest to the old wood, when weak, and to depend upon the next two for our supply. Where neatness is attended to in the minutæ, this practice we own will in time make the spurs more bulky, but the extent of the crop will be proportionably great. As the finest flavored grapes are supposed to be produced at the extremities of the branches, or on those that are farthest from the root, it consequently follows that a mode of training

similar to *figs. 1, 2, and 3*, will have that effect within the least space of wall, wholly occupied with vines.



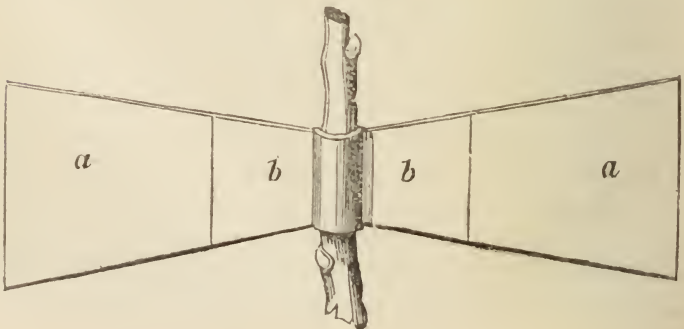
In conformity to this idea, as well as filling the empty spaces upon walls before the permanent trees fully extend themselves, a correspondent in the Horticultural Society's Transactions, proposes to train vines "horizontally under the coping of a garden-wall to a great distance, and by inverting the bearing shoots, the spaces between the other fruit-trees, and the top of the wall, could readily be filled up; and if different vines were enarched to the horizontal branch, the south wall of a large garden might be furnished with a variety of sorts from the stem and root of a single plant, the roots of which would not incumber the border, in which the other fruit-trees are

growing. I have," he says, "an experiment of this kind now in progress in my garden. Within a few years past, I have gradually trained bearing branches of a small black cluster grape, to the distance of nearly fifty feet from the root, and I find the bunches every year grow larger and ripen earlier, as the shoots continue to advance."

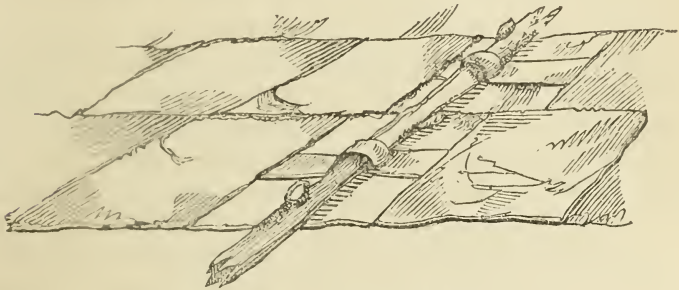
According to Knight's theory of the circulation of the sap the ascending sap must necessarily become enriched by the nutritious particles it meets with in its progress through the vessels of the alburnum; "but I suppose," he adds, "that there are certain limits, beyond which the sap would be so loaded with nutriment, that it could not freely circulate."

In pruning the vine at any season, or in any way, it is necessary to make the cut at least half an inch above the eye from whence the shoot is expected to spring; and it must be done in a sloping direction, to prevent the lodgment of moisture, which might tend to bring on decay, and consequently the ruin of the bud or embryo shoot. When the operation of pruning is completed, the shoots should be neatly nailed again to the walls, and they will require no farther care till the season of summer-pruning arrives.

In regard to the method of training and fastening the shoots of vines on the roofs of cottages, Mr. Latham of Aylesbury, recommends the following plan. He says, in the *Gardener's Magazine*, that gardeners and others are often deterred from training trees over slate and tile roofs, from the expense and trouble of trellis-work; but, by following the simple method attempted to be shewn on the annexed sketch, slating and tiling may soon be covered with the rich clothing of the grape-tree.



In the winter-pruning, take pieces of tin, six or seven inches in length, (*fig. a b*), the refuse of the tin-workers' shops will do, and at convenient distances turn it over the shoot intended to remain, and thrust part of the two ends (*aa*) between the tiles or slates. The weight of the incumbent tile or slate will be sufficient to keep the shoot in the place, so as not to be disturbed by winds.



PLANTING FRUIT-TREES.

All sorts of fruit trees may now be planted, if the weather be fine and the ground tolerably dry. It is, however, not advisable to plant in heavy wet lands at this season, for spring planting will, in such cases, be attended with more success. However, in lands tolerably dry, if the ground has been prepared as directed in January, February, &c. they may be planted in dry days, any time from the beginning of this month till the beginning of April.

PRUNING SMALL FRUITS.

Such plants as gooseberries, currants, and raspberries, should now be pruned, if there be time to spare. However, any time from now till the end of February will do equally well. Nevertheless, the more of this work which is done at this time, the less will be left to be done in the spring, which is generally a busy time for the gardener. It ought to be a maxim never lost sight of, "Never to leave for to-morrow, what can conveniently be done to-day." We can form no idea of the hinderance and obstruction which we may meet with in the winter months, therefore the more that is done now, with propriety, to forward the work of the garden, the greater the benefit which will be derived.

PLANTING SMALL FRUITS.

All sorts of small fruits, such as gooseberries, currants, and raspberries, should now be planted, if not done last month, unless the weather and soil be both very wet, in that case, the planting may with propriety be delayed some time longer.

DIGGING THE GROUND AMONG SMALL FRUITS.

As the pruning of these plants proceeds, let the ground be dug up in as rough a manner as possible, so that all the weeds, &c. may be buried; and if it be found inconvenient to prune them now, nevertheless let the digging go on, and take the opportunity of a few frosty days to prune them, when the ground will be hard enough to bear without much treading. If this rough digging can be done twice throughout the winter months, there is no doubt but the eggs or larvæ of many insects will be destroyed, by being turned up and thereby exposed to the frost, and more particularly to birds, which will now be more industrious in looking for such food, as their other sources of support are now nearly exhausted.

GATHERING LATE FRUITS.

If the season has been late, many of the late fruits will, probably, not yet be gathered in; this should now be done, before the frosts set in too severely upon them, and in that case, spoil them for keeping. In backward situations, the late fruits should have as much of the tree as possible, even although a slight frost should happen. It is of the utmost consequence to them that they be fully ripened; for if pulled before they be ripe, they will not keep so well, and are apt to shrivel and lose their flavor. Such, therefore, as can be for some time, previously to ripening, covered at night with mats, for fear of frost, will be much benefited thereby. For directions for gathering and storing, see (*last month*).

DIGGING THE GROUND AMONG YOUNG ORCHARD-TREES.

The following has been laid down by the late Nicol for the management of young orchard-grounds, until the trees come to a full bearing state, and the practice probably cannot be improved.

“ If the cultivation of orchard-fruits be industriously followed, the ground among the trees should be digged and kept with the hoe, for the first seven or eight years after planting. In order to defray the expense incurred in doing so, it is very proper to crop the ground with vegetables to a certain extent; but by no means to such an extent as to injure the trees; which, however, is too frequently the case, and is very erroneous. If the following rule, with respect to this matter were followed, the expense of keeping the ground and the rent would be fully paid; and the trees would not be injured, but, on the contrary, be benefited. Crop to within two feet of the trees the first year; a yard the second; four feet the third; and so on until finally relinquished; which of course would be against the eighth year, provided the trees were planted at the distances, and as directed in “ The Planting of Orchards.”

“ By this time, if the kinds have been well chosen, the temporary trees will be in full bearing, and will forthwith defray every necessary expense while they remain, or until the principal trees come into a bearing state, and it becomes necessary to remove them; after which, the ground should be sown down in grass. But until then, the ground should be properly cultivated, though not cropped, close to the trees; and a moderate quantity of manure should be digged in every second or third season.

“ This is a very proper time for doing so, whether the intervals be under crop or not. If they be under crop, pay respect to the spaces next the trees only; but if not, the whole ground may be digged. It should be laid up in a rough manner,” as we have so often recommended, “ giving it as much surface as possible, in order that the weather may fully act upon and meliorate the soil, thus fallowing it as far as the case will admit. Observe to dig carefully near the trees, and so as not to hurt their roots and fibres.”

In digging among trees at all times, particularly where the soil is shallow and the roots near the surface, we would recommend using a fork instead of a spade, as less likely to injure the roots.

D E C E M B E R.

There is scarcely any thing to be done in the fruit-garden this month, that cannot be done, with equal propriety, either the preceding month, or in the two subsequent months; we would, therefore, advise a speedy fulfilment of the directions laid down for last month and in January. This may be called the dead time of the year. However, neatness and regularity should ever be before the eyes of the gardener, who wishes to excel. In this month, when the weather will permit, all spare ground in the fruit-garden, which is not under crop, should be trenched, where the roots of the trees will admit of it; and where not, it should be rough dug. Pruning of every tree should be forwarded with all diligence; and where grounds or borders are in want of renewing, preparatory to being new planted, that work should be gone on with. The clearing of fruit-trees of moss and insects, as far as the latter can be effected, should occupy a share of his attention. In the compost-yard, much is to be done in turning over compost heaps, and in bringing in fresh matter for forming others. Indeed, this is one of the most useful employments of the gardener in winter, and one that is more neglected than any other. Wherever alterations are going on, on the manor, in the park, or by the sides of turnpike, or other roads, the gardener is most likely to find materials which will be either in their natural state highly useful to him for his fruit-tree borders, or by preparations, by adding manure or other materials, to correct the lightness or stiffness of such matter to a proper texture, to be afterwards allowed to prepare for a year, and during that time frequently turned over and well incorporated. Such preparations are of all the most useful for producing fine fruit and healthy trees, and should be collected in quantities, according to the size and circumstances of the place. In all places, the gardener should be allowed a horse or two, for the sole use of the garden; by such regulation much will be done that otherwise would be left undone, and no employment can be of so much consequence as the collection of materials for compounds; and this cannot be done if the means be not allowed him.

A

SYSTEMATIC CATALOGUE

OF

APPLES,

ARRANGED AS DESSERT AND CULINARY FRUITS.

APPLE, *Pyrus Malus*, of *Linnaeus*,—belongs to the class *Icosandria*, and order *Pentagynia*, and natural order *Rosaceæ*. Is a native of Britain, as well as most parts of Europe.

The apple is, of all the numerous fruits cultivated in the British gardens, the most useful; and is brought to a higher degree of perfection with less trouble than any other. It can accommodate itself almost to all soils, situations, and climates, that the middle and southern parts of Europe afford. At what time, or in what manner, the cultivated apple attracted the notice of the inhabitants of these kingdoms is not known. The uncultivated apple, or crab, must have been known to the aborigines; and the cultivated apple, in all probability, was introduced by the Romans. Pliny, the Roman Historian and Naturalist, knew of twenty varieties. It is probable that all, or at least part of those were brought by that people into this island; and if they, as well as other fruits, were lost after the Romans deserted this country, they must have been re-introduced by the Normans, soon after the conquest. It is not improbable, but that many of the apples introduced by the Romans were first planted in the neighbourhood of Hereford, where the Romans were long stationed. Haller mentions apple-trees in Herefordshire that had attained the great age of one thousand years, and were still prolific; but Mr. Knight considers two hundred years to be the ordinary duration of that tree. Herefordshire, it appears, was planted with apple and pear-trees at an early period: the aged pear-tree at Holme Lacey being a proof of that circumstance, as well as of the great longevity of that tree. Lord Scudamore, the then proprietor of Holme Lacey, while ambassador at the court of France, in Charles the First's time, is said to have collected, in Normandy, grafts of cider-apples, which he afterwards had grafted and planted in Herefordshire. In Henry the Eighth's time, his fruiterer, Harris, planted many Flanders apples and pears in Kent, probably some of which remain till this day. Of the merits, or number of varieties of apples cultivated so early, we have no certain information; and it would be unjust to judge of them by their present qualities. They, like most other plants, are supposed to have a limited duration; and therefore, on taking a retrospective view of the fruits of the early cultivators, or judging of the merits of such fruits by the old trees found near monastic ruins, we should not be doing them sufficient justice, as they are found so degenerated, or diseased, as no longer to deserve the attention of the cultivator; still they may have been excellent fruits when in their prime. Knight observes, "the *moil*, and its successful rival the *red-streak*, the *musts*, and *golden pippin*, are in the last stage of decay, and the *stire* and *fox-whelp* are hastening rapidly after them." The same horticulturist, after having made a variety of experiments to propagate or renew

the old sorts of apples, comes to this conclusion: "I think," he says, "that I am justified in the conclusion, that all plants of this species, however propagated from the same stock, partake in some degree of the same life, and will attend the progress of that life in the habits of its youth, its maturity, and its decay; though they will not be any way affected by any incidental injuries the parent tree may sustain after they are detached from it." Speechly, and latterly Williamson, in Hort. Trans., consider that the deterioration of the apple and pear, as well as other fruits, may be owing to the changes to which the climate of this country is supposed to have been subject; and that the return of genial seasons will restore to us, from old trees, as good fruit as heretofore. Such also is the opinion of the compiler of the Encyclopædia of Gardening; that intelligent writer considers Knight's doctrine contrary to the general analogy of vegetable life. "It is," he observes, "unquestionably true, that all varieties have a tendency to degenerate into the primitive character of the species; but to him it appears equally true, that any variety may be perpetuated, with all its excellences, by proper culture; and, more especially, varieties of trees. However unsuccessful Knight may have been in continuing the *moi*, *red-streak*, and *golden pippin*, we cannot," he says, "alter our conviction, that, by grafting from these sorts, they may be continued such as they are, or were, when the scions were taken from the trees to the end of time. As to plants propagated by extension, partaking, in some degree, of the same period of life as the parent, we cannot," he adds, "admit the idea as at all probable. Vines, olives, poplars, and willows, have been propagated by extension for ages, and are still, as far as can be ascertained, as vigorous as they were in the days of Noah or Pliny."

DESSERT APPLES.

1. PIPPIN, OLD GOLDEN.—This is one of the most ancient and best British fruits fit either for dessert, kitchen, or cider. This useful sort is fast hastening into decay. The fruit is small, roundish, of a beautiful golden color, and deserves a wall in most situations. It comes to perfection upon standards in favorable situations. The French admit this to be of English origin, and it is almost peculiar to this country. It does not succeed well upon the continent. It ripens in October, and keeps through the winter.

2. PIPPIN, GOLDEN WARWICKSHIRE.—See No. 143.

3. PIPPIN, DOWNTON.—A seedling, by Knight; originated about 1804. Is a juicy fruit, and resembles the golden pippin; is fit either for dessert or cider; fruit small, round, and yellow; flesh firm and sweet; lasts from October till March.

4. PIPPIN, ELTON, or *Knight's Golden Pippin*.—A seedling, by Knight; originated about 1802. Excellent for dessert or cider; tree a great bearer; fruit middle-sized, round, gold-colored, with spots; flesh firm and sweet. In use from October till February.

5. PIPPIN, FRANKLIN'S GOLDEN.—A sub-variety of the golden pippin; procured in 1780. Fruit middle-sized, conical, with gold and dark spots; keeps from November till March; flesh firm, and highly aromatic; middling bearer.

6. PIPPIN, HUGHES'S NEW GOLDEN.—A French fruit; procured in 1803. Fruit small, flat, and yellow; flesh firm and sweet; keeps from October till March. Tree rather delicate.

7. PIPPIN, FALL.—Sent to England by Mr. Cobbett, and described in Coxe's work on American Fruits, as worthy of general cultivation.

8. PIPPIN, SUDLOW'S FALL.—To distinguish it from the last, it bears the name of its introducer, John Sudlow, Esq., of Thames Ditton. Fruit small, about two

inches in diameter each way; eye large, with a wide shallow cavity, surrounded by regular folds or plaits; skin yellow, partially tinged with green, the whole sprinkled with minute brown spots; flesh inclining to yellow, crisp, very juicy, with a rich pleasant acidity. It ripens in November.

9. PIPPIN, BALGONIE.—An esteemed Scotch fruit, and known by the name of the Fife golden pippin. Is supposed to have been the original golden pippin imported from England about the time that that esteemed fruit was in its perfection. It inherits every virtue and property of the old golden pippin. Fruit middle-sized, round, yellow and green; flesh firm, juicy, and aromatic; keeps from October till May. Tree a great bearer, and hardy.

10. PIPPIN, LEMON.—Fruit large, oval, golden yellow; flesh firm and juicy; keeps from October till March. Tree vigorous, and a great bearer.

11. PIPPIN, RIBSTON.—Originated at Ribston Hall, in Yorkshire, in 1760. One of the finest fruits we have; rather above the middle size, round, and flattened; green, or dark green, when upon a standard, or much shaded; yellow and bright red, when upon a wall. In Scotland, it is often planted upon the best walls, and becomes a fruit of the first class. Upon standards, it fruits freely; being, in all situations, a great bearer. Keeps from November till March, and sometimes longer. It is not so fine a fruit when grown in England.

12. PIPPIN, NEWTOWN.—Supposed to be of American origin, and by some to be originally from Devonshire. Much esteemed in America, and known by the name of *Reinette de Canada*, as well as *Newtown Pippin*. It was brought here from America, in 1790. Fruit large, conical, yellow and red next the sun, greenish yellow where shaded. When much exposed, becomes almost red next the sun, and a beautiful golden colour when partially shaded; flesh firm, and flavour aromatic. Should be gathered before it becomes too ripe; if kept too long, is apt to become mealy; keeps from November till January. Healthy tree, and middling bearer.

13. PIPPIN, FRENCH, or *Pigeonette de Row*.—A French apple. Fruit middle-size, conical, dark red and yellow; flesh firm and aromatic; keeps from October till March. Tree indifferent bearer; habit weak and pendulous.

14. PIPPIN, BORSORF, or *German Queen's Pippin*.—A much-esteemed fruit in Germany. Fruit middle size, conical, yellow and green; an excellent table fruit; flesh firm and aromatic; keeps from September till February. Tree healthy, and middling bearer.

15. PIPPIN, NEW RED, *New Scarlet*.—Fruit beautiful and middle-sized; color dark red next the sun, yellowish where shaded; keeps till March. Tree middling bearer.

16. PIPPIN, DALMAHOY.—An esteemed Scotch fruit; rather smallish, round, and green; flesh firm and aromatic; excellent table fruit; keeps from November till May. Tree slender, hardy, and a great bearer.

17. PIPPIN, KENTISH, *Old Kentish Apple*.—An old variety. Fruit large, conical, yellow and red; flesh firm and sweet. Tree luxuriant grower, and good bearer. Keeps from December till March.

18. PIPPIN, ORLEANS.—Fruit small, flat, dark red, resembling Orleans plums; flesh firm and juicy; keeps from October till February. Tree slender.

19. PIPPIN, YELLOW INGESTRIE.—Resembles the golden pippin. A seedling, rose in 1800, by Knight. Fruit middle-sized, round, and yellow; flesh firm and juicy. Tree large and handsome. Fruit keeps from October till February.

20. PIPPIN, RED INGESTRIE.—Also resembles the golden pippin; a seedling, rose in 1800, by Knight. Fruit middle size, round, red; flesh firm and juicy; keeps from October till February. Tree large and handsome.

The yellow and red Ingestrie Pippins sprang from two seeds of the same apple, which occupied the same cell; their names are derived from Ingestrie, the seat of the Earl Talbot. The Grange Apple and Downton Pippin also sprang from the same parents with the Ingestries; from the seeds of the orange pippin, and pollen of the golden pippin. The original trees are at Wormsley Grange, Herefordshire.

21. PIPPIN, OSLIN, *Original Pippin, Arbroath Pippin*.—Supposed to have been first brought from France by the monks settled at Arbroath, in Scotland, at the early period of the building of, or probably soon after that celebrated abbey was built. It is supposed to be the *aurea mala*, or original golden apple. Fruit middle size; greenish yellow when shaded, golden yellow when exposed to the sun; flesh softish, and very juicy; is not a good keeper. In favourable soils is a great bearer. Much esteemed in Scotland.

22. PIPPIN, PADLEY'S.—Seedling, rose in 1800. Fruit oval, prickly, and freckled; flesh richly perfumed; keeps from September till February. Tree hardy, and a good bearer.

23. PIPPIN, QUEEN'S.—Fruit small, round, yellowish green; flesh firm and aromatic; keeps from January till May. Tree weakly; middling bearer.

24. PIPPIN, KIRKTON, *Crackled Pippin*.—A Scotch apple. Fruit flat, middle-sized, gold and russet; flesh firm and sweet; keeps from September till January. Tree a good bearer, small and hardy.

25. PIPPIN, FEARN'S.—Fruit small, conical, scarlet and yellow; flesh firm, juicy, and aromatic; keeps from October till March. Tree an indifferent bearer, and of slender habit.

26. PIPPIN, ORANGE.—A Herefordshire fruit. Fruit middle-size, conical, gold and red; showy at table; flesh firm, juicy, and sweet; keeps from October till March. Tree large and very luxuriant; middling bearer.

27. PIPPIN, LISBON.—Fruit middle-sized, conical, red next the sun, red and yellowish where partially shaded; flesh firm and rather sharp; keeps from November till February. Tree hardy and large; good bearer.

28. PIPPIN, GOGAR.—Originated at Gogar, an ancient seat near Edinburgh. Fruit middle-sized; an excellent table apple; keeps very late. Tree hardy, free grower, and good bearer.

29. PIPPIN, COCKLE'S.—Fruit small, round, russet-white where exposed, red and yellow where less exposed; flesh firm and sweet; in eating from January till April. Tree of humble growth, and a middling bearer.

30. PIPPIN, PARADISE.—Fruit middle size and flat, red and green; flesh firm and juicy; mealy when too ripe; keeps from October till February. Tree smallish; a good bearer.

31. PIPPIN, NEW ENGLAND.—An American fruit, introduced in 1780. Fruit large, angular, green and brown; flesh firm and sweet; keeps from October till March. Tree large and vigorous, and a good bearer.

32. PIPPIN, NORTH'S NEW SCARLET.—A seedling, recommended by the Hort. Soc. Fruit middle-sized, round, gold and pale red; flesh firm and aromatic; keeps from October till March. Tree healthy, and middling bearer.

33. PIPPIN, KING OF THE PIPPINS.—Fruit large, conical, gold streaked, white, and red; a beautiful fruit; flesh firm and juicy; in eating from January till March. Hardy upright growing tree, and an excellent bearer.

34. PIPPIN, WHITMORE.—Fruit large, round, streaked white, red, and yellow; handsome fruit; flesh firm and sweet; keeps from November till May. Tree luxuriant, and an excellent bearer.

35 PIPPIN, BRINDGWOOD.—A seedling, rose in 1800, by Knight. Fruit small, round reddish green; flesh rich and sweet; keeps from September till March. Tree hardy, and a good bearer. This variety sprang from the golden pippin and golden Harvey.

36. PIPPIN, WORMSLY.—Recommended in Hort. Trans. Fruit small, flat, green and yellow; a valuable addition to our gardens; flesh firm and juicy; keeps from October till February. Tree hardy, and a great bearer.

37. PIPPIN, WOOD'S NEW TRANSPARENT, *Wood's Huntingdon*.—From seed of the golden pippin, rose at Huntingdon in 1798. Fruit small, flat, green and yellow; flesh firm and juicy; keeps from October till March. Tree hardy, and great bearer.

In the Catalogue of the Horticultural Society of London, are enumerated 163 sorts of Pippins; of these 18 are varieties of the golden pippin. We avoid enumerating names only; and as no description is given of them, we must refer the enquiring reader to that Catalogue.

DESSERT PEARMAINS.

38. PEARMAIN, SUMMER.—Fruit middle-sized; conical, green striped with red; flesh soft, juicy, and sweet, having rather a peculiar flavor from almost every other apple. In use from August till October; should be eaten soon after gathering; soon gets mealy by keeping. Tree hardy, and a good bearer.

39. PEARMAIN, LOANS.—An esteemed apple in Scotland, as well as the last. Fruit larger than the last, oval, dull green where shaded, brilliant red where exposed to the sun; flesh firm and sharp; keeps from September till May. Tree middle size, and a good bearer.

40. PEARMAIN, SPANISH.—Fruit middle size, oblong and showy, dark red; flesh firm and sharp; keeps from September till May. Tree large, and a good bearer.

41. PEARMAIN, KIRK'S SCARLET.—Fruit middle size, oval, scarlet where exposed to the sun, red and yellow where more shaded; flesh firm and juicy; is an excellent fruit; keeps from October till June. Tree rather slender, and a middling bearer.

42. PEARMAIN, GOLDEN.—Fruit large, roundish, deep red where exposed to the sun, and yellowish in the shade; an excellent fruit; keeps from August till October. Tree large, and a good bearer.

43. PEARMAIN, LAMB ABBEY.—Supposed from seeds of the Newtown pippin, in 1805; recommended in the Hort. Trans., where it is figured. Fruit rather large, oval or pyramidal, yellow, green, and spotted red towards the sun; flesh crisp and aromatic; an exceedingly fine fruit; keeps from September till April. Tree luxuriant and handsome; good bearer.

44. PEARMAIN, OLD ENGLISH.—Fruit middle-sized, conical, red and yellow; flesh firm and juicy; in eating from January till March. Tree middle-sized, and great bearer.

45. PEARMAIN, KERNEL.—Fruit small, oval, streaked white and red; flesh firm and juicy; in eating from January till May. Tree rather tender, middling bearer.

In the Catalogue of the Horticultural Society, there are enumerated 33 sorts of pearn ains.

DESSERT NONPAREILS.

46. NONPAREIL, SCARLET.—From seed at Esher, about 1780, in the garden of a small public-house; first cultivated in the London nurseries by Grimwood. Fruit

middle-sized, flattened, russet and red; flesh firm and juicy; like all the other nonpareils high flavored; in eating from September till March. Tree hardier than any of the other sorts, a great bearer: all this division requires a wall in most situations.

47. **NONPAREIL, PITMASTON.**—From seed, in 1815. Fruit about the general size of the others in this division, and like them, flat and compressed, dull green, russet, and yellow; flesh firm, juicy, and aromatic; keeps from October till May. Tree slender twigged, often not ripened to the extremities of the shoots; a good bearer.

48. **NONPAREIL, EARLY.**—Fruit small, flat, reddish russet; flesh firm and juicy; is in eating from September till February. Tree tender; a good bearer.

49. **NONPAREIL, WRIGHT'S.**—Fruit large, flattened, brownish green; flesh firm and aromatic; keeps from November till June. Tree a great bearer, delicate, and makes very small wood.

50. **NONPAREIL, ROYAL.**—Fruit small, flattish, green and red; flesh firm and juicy; in eating from January till April. Tree slender twigged; a great bearer.

51. **NONPAREIL, M'DONALD'S.**—From seed, rose in the Dalkeith gardens about 1806; much esteemed in Scotland. Fruit small, round, (the only round one in this division,) fine eye, greenish and red; flesh firm, quick, and acid; keeps from December till April. Tree hardier than any of the nonpareils.

In the Horticultural Society's Catalogue, there are enumerated 30 sorts of nonpareils.

DESSERT RUSSETS.

52. **RUSSET, DREDGE'S.**—Fruit small, round, russet streaked with red; flesh firm and juicy; keeps from November till July. Tree hardy, middle size, and good bearer.

53. **RUSSET, LETHERCOAT, *Royal Russet.***—Fruit large, round, russet and red; flesh firm and aromatic; keeps from October till April. Tree hardy, large growing, and a great bearer.

In the Horticultural Society's Catalogue, there are enumerated 29 russets.

DESSERT RENNETS.

54. **RENNET, GOLDEN, *Reinette dorée.***—Of French origin. Fruit middle-sized, flattish, red and yellow; flesh firm and juicy; showy fruit; keeps from September till February. Tree middle-sized, and a good bearer.

55. **RENNET, HOLLOW-EYED, *Cornwall.***—Fruit small, flattish, green, yellow, and russet; flesh firm and aromatic; a much-esteemed fruit; keeps from October till April.

56. **RENNET, GREY, *Grise.***—Of French origin. Fruit middle-sized, round, grey; flesh firm and sweet; keeps from October till March. Tree middle-sized, and a good bearer.

In the Horticultural Society's Catalogue, are enumerated 82 rennets.

DESSERT CALVELLES.

57. **CALVELL, SUMMER RED.**—Fruit small, oval, reddish white; flesh soft, juicy, and sweet; keeps from September till November. Tree hardy, middle size, great bearer.

58. **CALVELL, SUMMER WHITE.**—Fruit small, oval, whitish green; flesh soft, juicy, and acid; keeps from September till the end of October. Tree hardy, middle size, great bearer.

59. CALVELL, AUTUMN, *Calville d'Automne*.—Fruit large, oblong, reddish brown; flesh crisp, juicy, and vinous; much esteemed in France; keeps from October till January. Tree hardy, and good bearer.

In the Horticultural Society's Catalogue, are enumerated 11 calvelles.

DESSERT QUEENINGS.

60. QUEENING, SUMMER.—An esteemed Scotch apple. Fruit middle-sized, often large, much angled, greenish white, becoming dark, as if bruised, when over ripe; soft and very juicy; flavor excellent; ripe in August or September; keeps only a few days. Tree hardy, and a great bearer.

61. QUEENING, KERNEL.—Fruit large, angled, deep red and white; flesh firm and tender; an excellent cider as well as dessert fruit; keeps from October till April. Tree hardy, and great bearer.

In the Horticultural Society's Catalogue, are enumerated seven queenings.

DESSERT CODLINGS.

62. CODLING, SPRING GROVE.—Fruit small, conical, pale green; flesh soft and juicy; keeps from July till September. Tree hardy, and a great bearer.

DESSERT SORTS,

With Names either Descriptive, Arbitrary, Local, or Indicative.

63. ALEXANDER.—A Russian or Ukraine fruit. A magnificent fruit, often 16 inches by 14 inches in circumference, and weighs 19 ounces; of an obtuse conic shape, delicate red and green color; flesh firm and vinous; keeps from November till January. Tree middling large, very hardy, and tolerable bearer.

64. AROMATIC APPLE.—Is said to have been an inhabitant of Cornwall for centuries, though little known out of that county. The tree is an excellent bearer, and the fruit keeps till returning summer. The trees generally show marks of age and decay.

65. BEAUTY OF KENT.—Fruit large, conical, red next the sun, red and yellow streaked where more shaded; flesh firm, vinous; very showy fruit; keeps from September till April. Tree large and hardy, and a good bearer.

66. BELLE GRISSELDINE.—Of French origin. Fruit middle-sized, flattish, yellow and red; flesh firm and juicy; very showy fruit; keeps from September till March. Tree spreading, hardy for a French fruit, and a middling bearer.

67. BROWN BURNT-ISLAND, *Brown Burknott*.—Originated from seed in Scotland, in 1760. Fruit small, conical, pale green; flesh soft and juicy; propagates freely by cuttings; keeps from September till January. Tree middle-sized, and a great bearer.

68. BLACK.—Fruit middle size, conical, dark mahogany color; flesh firm and sweet; singular fruit; keeps from September till April. Great bearer.

69. BEST-POOLE, *Bess*, or *Bessy-pool*.—Of Welch origin. Fruit middle size, round, pale green and red; flesh firm, crisp, and vinous; in eating from January till April. Tree hardy, and a great bearer.

70. BAHE'S FINE SMALL.—Fruit small, oval, red and green; flesh firm and juicy; in eating from January till May. Tree slender and spreading; great bearer.

71. BRANDY APPLE, *Golden Harvey*.—Fruit small, resembling a golden pippin in shape, yellowish russet color, fine flavor; in use from January till March. Is much esteemed in Herefordshire, where it has been long cultivated. Tree handsome habit, and extremely hardy.

72. CARNATION.—Fruit middle size, oval, when exposed to the sun is a handsome showy fruit, green and red striped with carnation; flesh firm and vinous; keeps till May. Tree large, and a good bearer.

73. CADBURY POUND.—Fruit middling size, oblong, pale green; esteemed a good fruit; keeps from November till March. Tree free grower, and great bearer.

74. CHARTERAUX COURT PENDU.—Of French origin. A fine-flavored fruit, beautiful carmine next the sun, often striped with yellow and snowy white when shaded; flesh very tender and juicy; should be eaten off the tree. A good bearer, little known in England, much cultivated in Scotland, both as espalier and standard; keeps only a few weeks.

75. COURT PENDU, WHITE, *Corps Pendu*, or *Hanging Body*.—Fruit middle-sized, long, yellowish, hanging downwards (from thence the name); flesh firm and sugary; is in eating from January till March. Tree spreading; a good bearer.

76. DREDGE'S FAME.—Originated from seed in Wiltshire, about 1770. Fruit rather large, round and flattened, greenish yellow where shaded, and streaked with red where exposed to the sun; flesh firm, highly aromatic; an esteemed fruit; keeps from November till March. Tree forming a handsome outline, and a great bearer.

77. DREDGE'S FAIR MAID.—Another Wiltshire esteemed fruit, where it originated from seed about 1765, and is there known by that name, or *Dredge's Fair Maid of Wishford*. Fruit middle-sized, rather round, green where shaded, where exposed beautifully striped with red; flesh firm and tender; keeps from November till March. Tree handsome, and is a great bearer.

78. DREDGE'S QUEEN CHARLOTTE.—Another Wiltshire fruit, where it originated from seed about 1770. Fruit middle-sized, oval, and flattish, gold color and red; flesh firm, and highly aromatic; keeps till February. Tree middle-size, hardy, and is a great bearer.

79. DREDGE'S BEAUTY OF WILTS.—Another Wiltshire fruit. Fruit rather large, fine bright yellow, spotted red towards the sun. Is one of our finest apples, in point of general utility; keeps good for the table till March.

80. DREDGE'S WHITE LILY.—A beautiful apple, of exceedingly high flavor, and keeps good for the table till March. Originated in Wiltshire about 1750.

81. ELTON'S YELLOW KERNEL.—Fruit middle size, round, yellow; handsome good table fruit; keeps till March. Tree free grower, and great bearer.

82. ESOPUS SPITZEMBERG APPLE.—Of American origin; of so much excellence that it may well deserve the protection of a south wall, without which it is probable it will not succeed in this climate. Fruit large, form oblong, skin smooth and fair; the color a lively and brilliant red, approaching to scarlet, with many small yellow spots; flesh yellow, juice rich; is in maturity about Christmas.

83. FAMEUSE, or *Snow Apple*.—Introduced by Mr. Barclay, of Brompton, in 1790, from Canada. Fruit large, conical, dark red and yellow; flesh soft, white as snow, and juicy; keeps from October till February. Tree hardy, and a great bearer.

84. FENNOUILLET GRIS, *Pomme d'Anis*, *Fennel*, *Anise*, or *Anise Apple*.—Of French origin. Fruit middle-sized, of a grey color; flesh tender, and has a spicy taste like anise-seed; is ripe in September and October; does not keep. Tree small, but a good bearer; exceedingly well calculated for growing in pots, or vases.

85. FIG-APPLE.—Fruit small, oval, greenish yellow, fig-shaped (from thence the name); flesh crisp and sweet; is in eating from September till January. Tree very dwarf, and is a great bearer.

86. FLOWER OF KENT.—Fruit large, round, yellow, showy; flesh tender and vinous; keeps from September till April. Tree strong grower, and a good bearer.

87. GLOUCESTERSHIRE CREEPER.—Fruit small, conical, light green; flesh soft and sweet; keeps from August till December. Tree readily propagated by cuttings or layers; great bearer.

88. GOLDEN HARVEY.—See *Brandy Apple*.

89. GOLDEN KNOB.—An English seedling. Fruit small, roundish, gold and russet; flesh firm and juicy; keeps from October till April. Tree hardy.

90. GODOLPHIN.—Originated in Lord Godolphin's garden in 1792. Fruit large, oblong, streaked with white, red, and yellow; very beautiful; flesh firm and acid. Tree large, and a good bearer.

91. GILLYFLOWER.—Fruit large, oval, greenish where shaded, yellow and red next the sun; beautiful; flesh crisp and vinous; keeps from September till March. Tree middle-sized, and a good bearer.

92. GOLDEN GLOUCESTER.—Fruit middle-sized, golden yellow where shaded, red towards the sun; keeps till March.

93. GRAVENSTIN APPLE.—This is esteemed the best apple in Germany and the Low Countries, and is well entitled to the high reputation it has acquired. Resembles the Ribston pippin in size, and not unlike it in form. Ripens in October, and will keep till December, and may be fairly considered a rival to our Ribston pippin. The figure in this work was taken from a tree in the private garden of Mr. Lee, of the Hammersmith nursery, by Mr. Hart, Jun. The name is derived from Gravenstein, a ducal estate in Sleswick, and was first described by Hirschfeld. It is supposed to have been accidentally raised from seed in the gardens of the Duke of Angustenberg, in Holstein, although some suppose it to be of Italian origin. It is highly esteemed all over the north of Europe, and by them considered one of their best sorts. Fruit generally round, somewhat flattened, rather angular on the sides, eye sunk in a deep cavity, surrounded by several projecting folds or knobs; stalk very short, deeply inserted; skin smooth, of a fine clear straw color, streaked with red where exposed to the sun; flesh of a pale yellow color, not very fine in texture, juicy, and with a high vinous, sweet taste.

94. HALL-DOOR.—An esteemed Kentish apple. Fruit large, flat, yellowish green where shaded, streaked with red towards the sun; flesh firm, acid; in eating from January till March. Tree vigorous, and a great bearer.

95. HUBBARD'S APPLE.—A Norfolk apple. Fruit middle-sized, not handsome, is notwithstanding one of our best table apples; is in eating from January till April.

96. JUNE-EATING, *Jenetin, Geneton*.—Fruit small, roundish, yellow, sometimes reddish; flesh tender and juicy, rather sharp when not ripe; is apt to get mealy if over-ripe; should be eaten from the tree. Is one of our earliest fruits, and keeps for a week or so good. Tree of humble growth, suited for forcing or planting in pots; great bearer. Is ripe often in the end of June (hence the name), and always in the beginning of July.

97. JULY FLOWER APPLE.—An excellent Cornish apple. Fruit conical, color yellowish green, red towards the sun; leaves remarkably long and narrow. Tree luxuriant and irregular, not easily-trained; the fruit, when cut, emits an agreeable perfume.

98. JULIEN, or *Early Julien*.—Introduced by Mr. H. Ronalds, from Scotland. Is a very excellent early variety, ripening in the beginning of August. Middle size, of an irregular form, with many ribs or angles on the sides, which become very prominent round the eye; skin of a uniform pale yellow; flesh approaching to yellow, firm and crisp, having much the highest flavor of any of our early apples.

99. LADY'S FINGER.—An esteemed Scotch apple. Fruit middle-sized, conical, rather long, approaching to cylindrical, yellowish where shaded, reddish where exposed to the sun; flesh delicate, juicy, and high flavored; keeps from October till December. Tree rather small, pyramidal or upright, and a good bearer.

100. LONG-LASTER.—Fruit middle-sized, angular, fine yellow where shaded beautiful reddish color next the sun; keeps till the middle of May.

101. MARGILL.—An Oxfordshire apple. Fruit small, roundish, red and yellow; highly esteemed fruit; flesh firm and aromatic; keeps from November till March. Tree small, delicate-twigged, and a great bearer. Is often sold in the London market for a nonpareil, which it much resembles.

102. MARGARET APPLE, *Red June-eating*.—Fruit small, conical, yellow where shaded, streaked with red towards the sun; flesh sweet and tender, ripens in the end of July, or beginning of September, and keeps for a few weeks. Tree hardy, making small willow-like shoots; is nearly as great a bearer as the common June-eating.

103. NONSUCH.—An esteemed Scotch apple, where it is often grown upon walls. Fruit middle size, green where shaded, beautifully striped with brownish red where exposed to the sun; flesh firm, juicy, with a pleasant acid; ripens in September, and keeps till October or November. Is more apt to shrivel in keeping than almost any other apple. Tree free grower, and a good bearer.

104. OAK PEG, *Oaken Peg*.—Fruit middle-sized, oval, green and white streaked; flesh firm and juicy; is in eating from January till July. Tree rather twiggy, hardy, and a middling bearer.

105. ORD APPLE.—Originated about thirty years ago, by John Ord, Esq., at Purser's Cross, near Fulham, from the seed of the Newtown pippin, imported from America; is often sold in the London nurseries under the name of Newtown pippin. The fruit, although without any external beauty, is remarkably good, and possesses the property of a melting softness in eating, so that it might be said to melt in the mouth. The original tree is now in a very dilapidated state (if alive). The climate of this country is not sufficiently congenial to it.

106. POMROY, *Ring Apple*.—Of French origin. Fruit middle-sized, round, green and yellow; flesh soft and somewhat acid; is in eating from July to September. Tree low spreading habit, and only a middling bearer. It has a sub-variety, which is a winter fruit.

107. POMME D'APIA, *Apius's Apple*, or *Coreless Apple*.—A French fruit. Fruit very small, roundish, yellow in the shade, bright red next the sun; fruit without seeds or cores; flesh firm and juicy; in eating from October till July. Tree small; a great bearer.

108. POMME GRISE.—An American apple, introduced from Canada about 1760. Fruit middle-sized, flattish, of a russet color where shaded, beautiful red striped towards the sun; is an excellent fruit, ripens late, and keeps till March.

109. POMME DE DEUX ANIS, *Apple of two Seasons*.—Blossoms and fruits at the same time (thence the name). Fruit small, roundish, pale green; flesh soft and sweet; in eating from September till January. Tree small; good bearer.

110. POMME VIOLETTE, *The Violet Apple*.—Fruit large, pale green, striped with red towards the sun; flesh juicy, sugary, partaking somewhat of the flavor of violets (from thence the name). Is in-eating from October till February or March. Is of French origin. Tree handsome, middle-sized, indifferent bearer.

111. POOR MAN'S PROFIT.—Fruit below the middle size, oval, dingy colored; propagates by cuttings readily; keeps till January. Tree hardy; very prolific.

112. GREY LEADINGTON.—Fruit long, color when ripe yellowish green, hollow within, and when ripe the seeds make a rattling noise within, when shaken; good bearer, and tree extremely hardy; is in eating from November till January.

113. QUINCE APPLE.—Fruit middle-sized, resembling a quince (from thence the name), yellow, rather red towards the eye; flesh firm, pleasant sharp flavor; is in eating from January till April. Tree middle-sized, and a good bearer.

114. **ROYAL GEORGE.**—Fruit large, oval, yellow and green; flesh firm and sugary; beautiful fruit; keeps well; is in eating from January till June. Tree handsome, and a great bearer.

115. **RED BAY.**—An esteemed Herefordshire fruit. Fruit large, oblong, whitish where shaded, streaked with red next the sun; beautiful; flesh firm and juicy; keeps from October till March. Tree handsome, and great bearer.

116. **RIBSTON.**—(See *Pippin, Ribston.*)

117. **SYKE-HOUSE.**—A Yorkshire apple, from Syke-house in Yorkshire. Fruit middle-sized, orange towards the sun and sometimes inclining to red, yellow when much shaded; flesh firm and juicy; keeps till April. Tree large and spreading, a great bearer.

118. **SPICE APPLE.**—Fruit middle-sized, angular, yellow; flesh firm and sugary; in eating from January till March. Tree middle-sized; great bearer.

119. **SKERM'S KERNEL.**—Fruit middle-sized, beautifully streaked with red, deepest towards the eye, and a good deal of yellow towards the foot-stalk; conical; flesh firm and aromatic; keeps from July till April. Tree large and much spreading; good bearer.

120. **SPANISH ONION.**—Fruit rather below the middle size, round, russet where shaded, dull red towards the sun; flesh firm and sweet, an excellent fruit; keeps from October till March. Tree hardy, spreading, and a good bearer.

121. **TRANSPARENT APPLE.**—Introduced from Russia. Is rather curious; is showy upon the table, but not good flavored.

122. **WARD.**—Fruit under the middle size, flattish, fine red and yellow-green; flesh firm and juicy; is in eating from January till July; a valuable apple. Tree slender, twiggy, and a good bearer.

123. **WHEELER'S EXTREME.**—An English seedling. Fruit under the middle size, flattish, russet in the shade, streaked with red towards the sun; flesh crisp and sugary; in eating from December till April, or later. Tree hardy, and a great bearer.

124. **WHITE MUST.**—An esteemed Herefordshire fruit. Fruit middle-sized, greenish yellow, but red towards the sun; flavor rather tart, but agreeable; is in eating from January till April.

125. **PETIT JEAN APPLE.**—Introduced from Jersey, (where it appears to have been long cultivated and admired,) by General Le Couteur. Fruit oval, slightly flattened at both ends, eye small, placed in a confined cavity; stalk short and deeply inserted; color pale yellow where shaded, of a bright red where exposed to the sun; flesh very white, extremely tender, with a mild and agreeable juice; keeps till the end of the season.

CULINARY OR KITCHEN APPLES.

126. **PIPPIN, HOLLAND.**—Middle-sized, flattish, of a yellow and green color; ripens in October, and keeps till April; is a good bearer, and free growing tree.

127. **PIPPIN, LONDON, Five-crowned Pippin.**—Size large, of a round and rather flattened form; color green, striped with red; ripens in November, and keeps till April; a handsome spreading tree, and great bearer.

128. **PIPPIN, POUND.**—Fruit large, conical; color greenish yellow; ripens in January, and keeps till April. Tree vigorous, with large leaves, a rather indifferent bearer.

129. PIPPIN, KERRY.—Of Irish origin. Middle-sized fruit, roundish; color greenish yellow; ripens in October, and keeps till February; described in the Mem. of the Caledonian Hort. Soc. as a valuable fruit for kitchen purposes.

130. PIPPIN, HOLLOW-EYED.—Fruit middle-sized, eye deep, and oval; color yellow streaked with red; ripens in October, and keeps till June. Tree hardy, and a good bearer.

131. PIPPIN, SPENCER.—Fruit middle-sized, oblong; color yellowish green; ripens in December, and keeps till June. Tree hardy, and a free grower; good bearer.

132. PIPPIN, BROAD-EYED.—Fruit large, flat, having a broad eye; color greenish yellow; ripens in October, and keeps till May. Tree large and free grower; good bearer.

133. PIPPIN, BLAND'S SUMMER.—Fruit middle-sized, oval-shaped; color gold and green; ripens in September, and keeps till January. Tree hardy, and a good bearer.

134. PIPPIN, WILLIAM'S.—Originated about 1800. Fruit large for a pippin; merits not sufficiently known.

135. PIPPIN, LUCAS.—Fruit middle-sized, cylindrical; color orange; very showy; ripens in October, and keeps till May. Tree a good bearer, and of a handsome spreading form.

136. PIPPIN, CARBERRY.—Fruit large, oval; color deep green and red; ripens in October, and keeps till March. Tree hardy, of a spreading habit; great bearer.

137. PIPPIN, RUSSET. *Grey Pippin, Brown Pippin*.—Fruit middle-sized, roundish; color gold and russet; ripens in October, and keeps till March. Tree hardy and upright; good bearer.

138. PIPPIN, GRUMAS.—Fruit small, roundish; color yellow and green; ripens in January, and keeps till April. Tree a good bearer, but rather delicate.

139. PIPPIN, CARCEY.—Fruit below the middle size; form conical; color green, yellow, and red; ripens in November, and keeps till May. Tree free grower, and a good bearer.

140. PIPPIN, ISLE OF WIGHT.—Fruit middle-sized, roundish; color greenish yellow; ripens in October, and keeps till March. Tree hardy, and a good bearer.

141. PIPPIN, GRIDDLTON, or GRIDLESTON.—Fruit large, angular; color green; ripens in October, and keeps till March. Tree of vigorous growth; a good bearer.

142. PIPPIN, PEARSON'S. *Nottingham Apple*.—Originated about 1780. Fruit small, roundish; color yellow and gold; ripens in December, and keeps till April, but becomes dry and mealy in March. Tree a good bearer, and of a free upright habit.

143. PIPPIN, WARWICKSHIRE. *Warwick Golden Pippin*.—Fruit small, round; color gold and green, much resembling the golden pippin; ripens in November, and keeps till March. Tree delicate, slender-twigged, a good bearer; the fruit fit either for the table, kitchen, or cider.

144. PEARMAIN, ROYAL.—Fruit large, roundish: color red and yellowish green; ripens in November, and keeps till June. Tree middle-sized, free grower, and a great bearer.

145. PEARMAIN, HEREFORDSHIRE.—Fruit large, round; color pale green and spotted; ripens in October, and keeps till April. Tree hardy, grows to a large size; good bearer.

146. PEARMAIN, WINTER.—Often known by the same name as the last; originated in Herefordshire. Fruit middle-sized, oval; color green and red; ripens in September, and keeps till May; a much-esteemed fruit. Tree large, and a great bearer.

147. PEARMAIN, CORNISH.—Fruit middle-sized, rather long; color dull green on one side, and russet on the other; ripens in December, and keeps till April.

148. PEARMAIN, BELL'S.—Fruit middle-sized, oblong; color dull green and russet; ripens in October, and keeps till May. Tree handsome and free grower; a great bearer.

149. PEARMAIN, RED.—Fruit small, oval; color deep red and yellow; ripens in October, and keeps till April; fruit excellent. Tree handsome, and great bearer.

150. PEARMAIN, BAXTER'S.—Fruit large, oblong; color green and red; ripens in October, and keeps till June. Tree handsome, and a good bearer.

151. PEARMAIN, PICKERING'S.—Fruit small, oval; color green, striped with red; ripens in October, and keeps till March. Tree hardy, and a good bearer.

152. RENNET, KITCHEN.—An esteemed Lincolnshire apple. Fruit large, oval; color greenish red. Tree hardy, with slender twigs; a great bearer.

153. RENNET, LINCOLNSHIRE.—Another esteemed fruit of the same county. Fruit large, obtusely conical; color brownish green; ripens in December, and keeps till July. Tree vigorous, with large leaves; a great bearer.

154. RENNET, LORD CAMDEN'S.—Fruit large, of a flattened oval form; color russet and red; ripens in October, and keeps till April; a much-esteemed fruit. Tree handsome, and pretty good bearer.

155. RENNET, MONSTROUS.—Fruit very large, oblong; color red and dark green.

156. RENNET, ENGLISH.—Fruit middle size, oval; color yellowish green; ripens in October, and keeps till March. Tree free grower, and good bearer.

157. RENNET, TREVOIDER.—Fruit small, round; color yellow and red; ripens in December, and keeps till May. Tree very hardy.

158. RENNET, MOTHER.—Fruit middle-sized, round; color yellow and brown; ripens in November, and keeps till March; an esteemed fruit. Tree hardy, and a good bearer.

159. RENNET, SPICE.—Fruit small, round; color green and red; ripens in October, and keeps till March.

160. RENNET, FRENCH. *White Rennet*.—Fruit large and roundish; color pale yellow, beautifully striped with red when exposed to the sun; ripens in October, and keeps till February, and sometimes till March. Tree delicate, but a good bearer; better suited for an espalier than a standard in most situations, but not sufficiently valuable for a wall.

161. RENNET, CANADIAN.—Fruit large, oval; color pale green; ripens in November, and keeps till February. Tree hardy, and vigorous in growth.

162. RENNET, DWARF. *Grey Rennet*.—Fruit middle size, round; color grey, or greyish white; ripens in November, and keeps till March.

163. RUSSET, ACKLAM'S.—A Yorkshire apple. Fruit middle-sized; color russet next the sun, and yellow on the shaded side; ripens in January, and keeps till March.

164. RUSSET, GOLDEN.—Fruit middle size, round; color yellow russet; ripens in October, and keeps till May. Tree hardy and spreading; a good bearer.

165. RUSSET, SHARP'S.—Fruit below the middle size; form approaching to the frustum of a cone; color brown and red streaked; ripens in October, and keeps till May. Tree upright while young, spreading when old; a good bearer.

166. RUSSET, WHEELER'S.—Fruit middle-sized, roundish; color brown russet; ripens in November, and keeps till April; a good fruit. Tree upright, twigs slender, a good bearer.

167. RUSSET, CORNISH.—Fruit below the middle size, flat and roundish; color russet and somewhat green, particularly where shaded; ripens in January, and keeps till June; a valuable fruit. Tree growing rather upright; a good bearer.

168. RUSSET, DREDGE'S.—Fruit below the middle size; color greenish russet; ripens in November, and keeps till July.

169. RUSSET, WINE.—Fruit middle size, conical; color dark russet; ripens in December, and keeps till May; a good fruit. Tree upright and slender; a good bearer.

170. RUSSET, ADAMS'.—A Yorkshire apple. Fruit small, round; color russet and yellow; ripens in January, and keeps till March. Tree vigorous and spreading; a good bearer.

171. RUSSET, GREAT.—Fruit large, roundish; color russet, streaked with red; ripens in December; keeps till March. Tree hardy, and a good bearer.

172. RUSSET, CARAWAY.—Fruit small, roundish; color russet and yellow; ripens in January, and keeps till May. Tree hardy, but with slender twigs; an indifferent bearer.

173. RUSSET, PILE'S.—Fruit middle-sized, round and flat; ripens in December, and keeps till May; a much-esteemed fruit. Tree hardy, and a great bearer.

174. RUSSET, HARVEY'S.—Fruit large, oval; color green russet; ripens in December, and keeps till May. Tree upright in growth, and a great bearer.

175. CODLING, FRENCH.—Fruit large, conical, and ribbed; color yellowish green; ripens in August, and keeps till January. Tree hardy; a great bearer; and is readily propagated by cuttings.

176. CODLING, KESWICK, *Carlisle Codling*.—Fruit small, but when a thin crop about the middle size, ribbed and conical; color light green and white; ripens in July, and will keep till the beginning of December. Tree very hardy, and capable of being propagated by cuttings; probably the most prolific apple we have. The fruit is used when very young, as well as when ripe.

177. CODLING, HAWTHORN DEAN, *White Apple of Hawthorn Dean*.—Is said to have been introduced by, or originated with, the celebrated Drummond, of Hawthorn Dean, and takes the name of that romantic retreat on the river Esk, near Roslin, in the neighbourhood of Edinburgh. Fruit large; color pale green, white where shaded, and beautifully striped with delicate red where exposed to the sun; ripens in August, and will keep till January; but is apt to become shrivelled by the end of that month. Tree hardy, and, next to the last, the greatest bearer we have. It is a great acquisition to the market-gardeners and fruit-growers. It is a hardy free grower, and not liable to diseases. It begins, like the last, to bear the second year after planting. Were they both better keepers, they might be termed the most useful apples we have. It thrives in any situation, and will do better in a north aspect than any other apple yet known. In the gardens of cottagers and artisans, both these apples should find a place.

178. CODLING, STOUR.—Fruit large, oblong, and ribbed; color pale green and red; ripens in October, and keeps till May; a valuable fruit. Tree of great size, hardy, and a great bearer.

179. CODLING, ROYAL.—Fruit very large, conical, and ribbed; color whitish yellow; ripens in September, but does not keep long. Tree a free grower, and a good bearer.

180. CODLING, KENTISH, *Burknott Codling*.—Fruit below the middle size, conical; color pale green; ripens in August, and keeps till January. Tree vigorous grower, and a great bearer.

181. BIGG'S NONE-SUCH.—Originated about 1750. Fruit middle size, conical; color yellow variegated with red; ripens in September, and keeps till January. Tree free grower, and good bearer.

182. EVE-APPLE.—Of Irish origin. Fruit small, round; color red and green; ripens in October, and keeps till July. Tree hardy; capable of being propagated by cuttings.

183. **YORKSHIRE GREENING.**—Supposed to be originally from Yorkshire. Fruit above the middle size, conical; color dull red and green; ripens in January, and will keep till August, and sometimes longer. It is one of our most valuable kitchen apples, and succeeds well in almost all situations. Tree large and spreading, and is a very great bearer.

184. **BOVEY RED-STREAK.**—Fruit middle-sized, rather flattish; color deep red and white; ripens in January, and keeps till April; is altogether a good fruit. Tree hardy, and a good bearer.

185. **LONGLEAT RED-STREAK.**—Originated in Wiltshire about 1785. Fruit middle-sized, round; color yellow streaked with red; ripens in September, and keeps only till October. Tree a free grower, and a great bearer.

186. **NINE-SQUARE.**—Supposed to have originated in Gloucestershire, where it is still much admired. Fruit large, angular; color red and yellow; ripens in October, and keeps till April. Tree hardy, and a good bearer.

187. **MINIER'S DUMPLING.**—Originated about 1765. Fruit rather above the middle size, round, and flattened; color deep gold and red; ripens in December, and keeps till April. Tree middle-sized, and a good bearer.

188. **POMROY.**—Fruit large, flattish; color red and green; very showy; ripens in January, and keeps till March. Tree large, and a good bearer.

189. **RED SWEET.**—A Cornwall fruit. Fruit small, oval; color red and green yellow; ripens in November, and keeps till March. Tree of vigorous growth, and a middling bearer.

190. **NORFOLK COLMAN.**—Fruit middle size, conical; color mahogany and dark green; ripens in December, and will keep till August.

191. **NORFOLK BEAUFIN.**—Fruit above the middle size, round and flattened; color deep red on the exposed side, pale green where shaded; in use from December till August. This is one of our most valuable kitchen apples, and possesses the properties of being a great bearer, excellent keeper, and good baker or boiler. Is much esteemed in Norfolk, and is there dressed in a peculiar manner. Tree sufficiently hardy to stand in any part of the kingdom, and not subject to diseases. Of all our keeping apples, none better merits a place in small gardens than this.

192. **AROMATIC.**—Fruit middle-sized, oval; color yellow and red; in use from December till May; an esteemed apple. Tree rather slender, and only a middling bearer.

193. **CAT'S HEAD.**—An esteemed Scotch fruit. Large, oblong; color grey, yellow generally; but, when fully exposed to the sun, of a reddish cast; ripens in January, and keeps till May. Tree vigorous, grows to a great size, and is an abundant bearer.

194. **BALTIMORE.**—Of American origin. Fruit very large, often fourteen or fifteen inches in circumference, and has been known to weigh above one pound and a half; color fine red and green; a magnificent fruit, but, like most American apples, an indifferent bearer in this country; with us the climate is not suitable to bring them to perfection. To use the words of a valued correspondent, it would be better not to plant any of the trees, and import the fruit. This observation may be justly applied to nine-tenths of the apples and pears, in particular, lately introduced: a few of them may be planted; but where the supply of a family or the market is an object, they cannot be depended upon; one-half of them will not bear fruit in this climate, and the other half will only be eatable one season in five.

195. **COCKAGEE.**—Fruit middle-sized; colour red and yellow; ripens in October, and will only keep till the middle or end of December. Tree of vigorous growth, and a great bearer.

196. DREDGE'S BEAUTY OF WILTS; *Red Anise*.—Originated in Wiltshire about 1750. Fruit above the middle size, oval; color bright yellow, spotted with red; in use from October till March. One of the best apples yet known, in point of general utility. Tree hardy, and a great bearer.

197. DUMPLING.—An old Norfolk fruit. Above the middle size, flattish, round; color greenish streaked with red, often much so; keeps till March. Tree hardy, and a good bearer. (Not the dumpling apple of the Americans.)

198. HAMPSHIRE NONE-SUCH.—Fruit large and conical; color green yellow, streaked with red; in use from September till December; a valuable fruit. Tree vigorous, and succeeds better upon chalky bottoms than most other apples; is a great bearer.

199. FRENCH CRAB.—Fruit large, oval; color deep green and red; will keep from one season to another; a valuable fruit, and should have a place in every garden. Tree of a handsome upright habit, and a great bearer.

200. PIGEONETTE.—Originally from Brittany. Fruit below the middle size, conical; color pale red, and showy; ripens in October, and keeps till March. Tree hardy, with slender twigs; rather an indifferent bearer.

201. GOLDEN MUNDI.—Fruit small, round; color green and red; ripens in October, and keeps till January. Tree spreading, of no great height, and a good bearer.

202. HEDGE.—Fruit middle size, conical; color red and straw; in use from October till April. Tree upright in habit, and a good bearer.

203. GOLDEN GLOUCESTER.—Fruit middle-sized, oval; color gold and red; in use from December till March. Tree hardy, of spreading habit; a good bearer.

204. POMME GRISE.—Originally from Canada, about 1790. Fruit middle-sized, oval; color russet and red; ripens in September, and keeps till January. Tree of vigorous growth; like other American apples, with us an indifferent bearer.

205. NONE-SUCH.—An esteemed Scotch fruit. Often there planted against walls (where it becomes an excellent table apple); upon standards middle-sized, roundish; color grass-green, where shaded russet brown, often reddish where exposed to the sun; in use in September and October, when kept longer, becomes acid and shrivelled. Tree of slender habits, often having the extremities of the shoots unripened; in such cases liable to canker; is a good bearer. It is said to afford a much less portion of sauce than most other apples.

206. HALLINGBURY.—Fruit large, flat, and much ribbed; color red and yellow; ripens in October, and keeps till March. Tree of vigorous growth, and but an indifferent bearer.

207. HUBBARD'S RUSSET PEARMAIN.—Fruit above the middle size, roundish; color dark russet; ripens in January, and keeps till April. Tree of upright habit, slender twigged, a middling bearer.

208. LONG LASTER.—Fruit middle-sized, conical, rather angled; color fine yellow and red; ripens in October, and keeps till May.

209. MAJOR HEMMING.—Fruit middle-sized, round; color light green and brown; ripens in November, and keeps till March.

210. KIRK'S SEEDLING.—Originated with Mr. Joseph Kirk, of the Brompton Nursery, a well-known fruit-tree grower. Fruit large, round; color red and yellow; ripens in December, and keeps till May. Tree of vigorous growth, and a great bearer.

211. KENTISH FILL-BASKET. *Kentish Codling*.—Fruit large, conical; color pale green; ripens in August, and lasts till October. Tree a middling bearer.

212. **MINSHUL CRAB.**—Originally from Lancashire. Fruit middle size, roundish ; color yellow, with brown spots ; ripens in September, and keeps till April. Tree vigorous grower, a great bearer, and valuable fruit.

213. **MAY GENNET.**—Fruit below the middle size, conical ; color green-yellow striped with red ; ripens in October, and keeps till April.

214. **DYMOCK RED.**—Fruit below the middle size, round ; color red and yellow ; ripens in January, and keeps till April. Tree hardy, of spreading habits, and a good bearer.

215. **DUTCH QUEENING.**—Fruit large, oblong ; color red and green ; ripens in January, and keeps till March. Tree hardy, of spreading habit, and a great bearer.

216. **KERNEL, REDSTREAK.**—Fruit middle size, conical ; color red and yellow ; ripens in December, and keeps till April. Tree handsome, forms leaves unusually broad ; a great bearer.

217. **EMBROIDERED.**—Fruit above the middle size, oval ; with broad streaks of red ; ripens in October, and keeps till February. Tree vigorous, with broad leaves ; a good bearer.

218. **JOHN.**—A Devonshire and Herefordshire fruit, of middle size, and much esteemed both for cider, kitchen, and table.

219. **FRENCH SPANIARD.**—Fruit middle size. Tree indifferent bearer.

220. **EVERLASTING.**—Fruit below the middle size, conical ; streaked with green and red ; ripens in October, and keeps till February. Tree hardy, twigs slender, and a good bearer.

221. **GREEN DRAGON.**—Originated at Enmore Castle, about 1780. Fruit large, of an hexagonal prism form ; color green and red ; ripens in September, and keeps till February. Tree vigorous, with rather broad leaves, rather an indifferent bearer.

222. **HEREFORDSHIRE RED-STREAK.**—Much cultivated in Herefordshire and the adjoining counties. Fruit middle-sized, oblong ; color green streaked with red ; ripens in January, and keeps till April. Tree vigorous, and a good bearer.

223. **WINTER BOX.**—Fruit middle-sized, conical, rough ; color light green ; ripens in December, and keeps till February. Tree hardy, twigs slender ; a good bearer.

224. **WHITE MUST.**—Another Herefordshire fruit of middling size, flattish ; color greenish yellow with red ; ripens in January, and keeps till June. Tree haray, of spreading habit ; a good bearer.

225. **LONG SEAM.**—Fruit large, angular ; color light green ; ripens in November, and keeps till February. Tree hardy ; a good bearer.

226. **OLD RED MUST.**—A Herefordshire fruit long in cultivation. Fruit large, oval ; color pale red and green ; ripens in January, and keeps till August. Tree hardy, with broad leaves ; great bearer.

227. **WINTER POMROY.**—Fruit large, conical ; color dark green striped with red ; ripens in October, and keeps till January. Tree hardy, upright, with broad leaves ; a good bearer.

228. **LORD CHENEY'S.**—Originated about 1760, much resembling the Yorkshire Greening. Fruit middle-sized, conical ; color dark green and chocolate ; ripens in December, and keeps till June. Tree hardy, free grower, leaves small ; a good bearer.

229. **LORD ARUNDEL.**—Of French origin. Fruit large, angular ; color green and dingy red ; ripens in December, and keeps till May. Tree having small leaves, of elegant outline ; rather an indifferent bearer.

230. **TANKERTON.**—Fruit large, conical; color yellow, with a little red, particularly where exposed; ripens in December, and keeps till February; a valuable kitchen apple. Tree large, and a good bearer.

231. **MAIDEN'S BLUSH.**—Fruit large, angular; color green and dingy red; ripens in December, and keeps till May. Tree having small leaves, of elegant form, but a very indifferent bearer.

232. **TRANSPARENT CRAB.**—A Russian apple, often known by the name of the Moscow Apple. Fruit rather small, round; color transparent red; in use in September and October. Tree very small; a great bearer. The fruit much used for preserving.

233. **SPANIARD.**—Much cultivated in Cornwall, and said to have been originally brought from Spain. Fruit above the middle size, oblong; color greenish yellow; ripens in December, and keeps till April. Tree delicate with us, and an indifferent bearer. Should only be planted in very favorable situations; does not succeed in the north of England.

234. **PULSWAN.**—Fruit below the middle size, conical; color greenish yellow; ripens in December, and keeps till May. Tree vigorous, with broad leaves; a good bearer.

235. **MANSFIELD.**—A Nottingham and Yorkshire apple. Fruit large, oblong; color green and bright red, with dark spots; ripens in December, and keeps till February. Much esteemed as a cider apple. Tree hardy, spreading, and a great bearer.

236. **NORFOLK PARADISE.**—An apple much esteemed in Norfolk. Fruit large, round; color pale red and green; ripens in December, and keeps till February. Tree hardy, with broad leaves; a great bearer.

237. **GLOUCESTERSHIRE QUEENING.**—Fruit large, very irregularly ridged; color dark red; ripens in October, and keeps till April. Tree vigorous and spreading; a great bearer.

238. **NEW RED MUST.**—Fruit large, round; color pale red and green; ripens in December, and keeps till February. Tree hardy, and a good bearer.

239. **DREDGE'S SEEDLING.**—Fruit large; color yellowish green striped with red, particularly on the exposed side; ripens in November, and keeps till January.

240. **BLACK APPLE.**—Fruit middle-sized; of a dark mahogany color next the sun, but much lighter on the opposite side; ripens in November, and keeps till April.

241. **BOOMREY.**—Fruit above the middle size, flattish; color deep red externally, internally streaked with red also; keeps till April; a good kitchen or cider apple, but not good for eating raw.

242. **CARNATION APPLE.**—Fruit middle-sized; beautifully striped with red; ripens in January, and keeps till May.

243. **JULY-FLOWER.**—Fruit middle-sized; color yellowish green; and beautifully striped with red towards the sun; ripens in December, and keeps till March.

244. **HAGLOE CRAB.**—Fruit below the middle size, conical shaped; color yellowish; is ripe in January; fit either for baking or cider.

245. **POMME VIOLETTE, Violet Apple.**—Fruit above the middle size; color pale green, striped with red towards the sun; has much the smell of violets, from thence the name; ripens in October, and keeps till February, or later.

246. **QUINCE APPLE.**—Fruit middle-sized; color yellow, a little red towards the eye; ripens in January, and lasts till April.

247. **REG BAY.**—An esteemed Herefordshire apple. Fruit large; beautifully streaked all over with red; shape longish; in use about the end of October.

248. SEEK NO FARTHER.—Fruit above the middle size; color pale green, a little streaked with red; comes into use in January, and lasts till May, but becomes mealy by the beginning of April.

249. WARD APPLE.—Fruit rather below the middle size; flat shaped; color fine red towards the eye; of a yellowish green towards the footstalk; keeps till June.

250. WHEELER'S EXTREME.—Resembles the Pomme Grise. Fruit below the middle size; flat shaped; color beautifully clouded with red on a yellowish russet ground; keeps till April.

P E A R S,

ARRANGED AS DESSERT AND CULINARY FRUITS.

PEAR, *Pyrus communis* of *Linnaeus*,—belongs to the class *Icosandria*, and order *Pentagynia*, and is arranged in the natural order *Rosacea*. Is a native of Britain, as well as of many parts of Europe as far north as latitude 61°.

The cultivated pear differs from the apple, not only in its character, or habit of growth, but also in being more apt to send up suckers from the roots; in sending out tap-roots; in being much longer in coming into fruit from seed; and also being either grafted, or upon its own roots, much longer lived. It is well known to live for several centuries; and is, probably, of all our fruit-trees, excepting the chesnut, the longest liver. It is much harder and less nice of its situation of growth than the apple, and will grow in almost all soils and situations. Knight observes, that the identical trees that supplied the inhabitants of Herefordshire with perry in the seventeenth century, are like also to supply those of the nineteenth. As an ornamental tree, it is much superior to the apple; some sorts, the *Barland* and *Olfield* for example, form extremely handsome outlines of form, and when planted in the orchards, among apples, take off, in a great measure, that stiff formal appearance which the apple generally assumes. At what time the cultivated pear attracted the notice of the inhabitants of this country is not certainly known, but, as we have observed of the apple, was probably known or used in its wild state by the Britons before the Roman invasion; after that epoch, we are to suppose that they became acquainted with this fruit by its introduction by these people. The pear ranks next to the apple in point of usefulness, as it is not only used in various ways as a culinary fruit, but the expressed juice is made into the well-known liquor, perry, which is an article of commerce in several counties of England. That of the two sorts of trees mentioned above, if well manufactured, fetches the high price of ten and fifteen pounds per hogshead, upon the spot where it is made. The French prepare a perry which is little inferior to wine. They also dry the bad-eating sorts of pears, which they keep for several years. With them the varieties of pears are greater than that of apples. With us the varieties are also extremely numerous, and our catalogues are daily increasing, at least in names. Parkinson enumerates 64 sorts of pears. Miller has selected 80 sorts, and described them. The catalogues of one of the Paris nurseries contain 189 select sorts. Our London nurseries' catalogues name from 200 to 300 sorts; and the Horticultural Society's Catalogue, lately published, contains 622 sorts. Flemish pears have long been considered superior to ours, and when brought into use, will give quite a new feature to the dessert.

Many sorts of them are in a thriving state in the garden of the Horticultural Society, and will probably be described at a future period by that society; till such time, we must content ourselves with such sorts as are already described, or which are so well known as to deserve cultivation.

The largest collection of pears in the world, is that of Van Mons, at Brussels; who has established a fruit-tree nursery, in which are grown upwards of eight hundred new varieties of pears, raised by himself and Mr. Duquesne, of Mons, besides new varieties of other hardy fruit-trees.

DESSERT PEARS.

Summer Fruit, arranged in the Order of their Ripening.

1. CITRON DES CARMES, or *Magdalen*.—Ripens in July; rather a round fruit, tapering towards the stalk; very juicy; should be eaten off the tree; keeps only a few days; of a yellowish green color; middle size; much improved both in flavor and earliness, if planted upon a wall. One tree is sufficient for a large garden; and for smaller gardens, one or two grafts will be plenty, introduced upon another tree.

2. LITTLE MUSK, or *Supreme*.—Ripens about the end of July, or beginning of August; fruit yellow when ripe; juice somewhat musky; should be gathered before it is too ripe; keeps only a few days, and should be eaten off the tree; is a good bearer. One tree is sufficient for a large garden; for smaller gardens, one or two grafts will be plenty, introduced upon some other tree.

3. CHIO, or *Little Bastard Musk*.—Ripens about the same time with the last; is smaller; of a yellow color when ripe, having a few streaks of red on the side next the sun; is juicy and melting; keeps only a few days, and should be eaten soon after gathering.

4. EARLY CARNOCK.—Of a yellow color, red towards the sun; rather an indifferent pear, fitted for standards only.

5. PEAR, JAMES'.—A Scotch fruit, as well as the last; is the earliest native pear of that country; has little flavor, and keeps only a few days; is a good bearer. The above five pears may with propriety be wrought upon the same tree, and will afford sufficient quantity for most families.

6. GREEN CHISSEL, or *Hastings*.—Ripens about the beginning of August; is a good bearer; is middle-sized, and the fruit remains always green; it grows closely to the branch, and often in long clusters; is much grown in many parts of Hampshire and Sussex.

7. LITTLE MUSCAT.—A very small fruit, having a very thin skin; color yellowish when ripe; flavor rich musky, and only keeps a few days.

8. RED MUSCADELLE.—Fruit large and beautiful; the color yellow, striped with red; flavor rich. It sometimes produces two crops in a year, the first about the end of July, and the second in September.

9. GREEN PINKY.—Fruit small and nearly round; of good flavor; originated at Pinky, near Edinburgh; is much esteemed in Scotland; great bearer, and a healthy tree.

10. LEMON, *Lady's Lemon*, or *Lady Lamont*.—An excellent bearer. Fruit not much esteemed, unless for its earliness.

11. PEAR SAUCH.—A Clydesdale pear. The fruit large and beautiful; the tree healthy, and a great bearer; is an excellent market pear.

12. FERROW COW.—Another Clydesdale fruit. Large, flattened towards the eye of the fruit, with a short foot-stalk; a great bearer, and beautiful fruit; color red and yellow; flesh tender and musky; tree hardy, and of a pendulous habit.

13. GREY HONEY.—Fruit pretty good ; ripens in August.

14. GREEN ORANGE, or *Orange Vert*.—A middling good early fruit ; ripens in August.

15. POPE'S PEAR.—An early pear of no great merits ; ripens in August.

16. GOLDEN KNAP.—A much better fruit than either of the three last ; ripens in August.

17. JARGONELLE, *Cuisse Madame*.—A French fruit ; ripens in August. Fruit large ; skin smooth ; color pale green ; a good bearer, and good flavor. Tree healthy and vigorous, somewhat like the Windsor, and does best on standards in England ; but is worth an east or west wall in Scotland, or in any late situation. There are some very old trees of this sort in many parts of the kingdom which must have been early introduced.

18. LADY'S THIGH.—This is the true *Jargonelle*, and the *Cuisse Madame* of the French. Has been early introduced into this country. Color russet-green and iron ; ripens from the middle of August to the beginning of September ; flavor rich and musky ; an indifferent bearer. Tree vigorous, and in character resembles the *Jargonelle* and Windsor. These two trees have hitherto been confounded together ; it is supposed that the names have been changed in coming to this country by accident.

19. WINDSOR.—An English pear. Skin smooth ; color when ripe of a yellowish green ; the flesh soft, and if permitted to hang two or three days after it is ripe grows mealy and useless ; ripens in August ; is an indifferent bearer.

20. ORANGE MUSK.—Ripens about the end of August ; the flesh is musky, but dry ; color yellow, spotted with black.

21. GREAT BLANQUET, or *Bagpipe of Anjou*.—Ripens about the middle of August ; skin smooth, of a pale green color ; flesh soft, and full of juice ; flavor rich ; and rather a good bearer.

22. LITTLE BLANQUET.—Much smaller than the last ; color pale ; flesh tender, and full of rich musky juice ; ripens about the end of August.

23. LONG-STALKED BLANQUET.—Ripens latter end of August ; skin smooth ; color white, a little tinged towards the sun ; juice rich and sugary.

24. EARLY ACHAN.—A pear much inferior to the winter pear of that name ; ripens in August ; should be eaten off the tree.

25. CRAWFORD, or *Lammas*.—Ripens about the end of August ; an esteemed Scotch fruit ; should be eaten a few days after gathering ; color green, rather tinged with iron towards the sun ; great bearer, and of a juicy good flavour, if not too ripe ; keeps only ten or fifteen days. Tree vigorous, and grows in almost any situation ; middle sized fruit, improved if on a wall.

26. SKINLESS, or *Early Russet*.—Ripens the latter end of August ; skin extremely thin (from thence the name) ; color reddish ; flesh melting, and full of rich sugary juice.

27. QUEEN'S PEAR, or *Musk Robert*, or *Amber Pear*.—Ripens the latter end of August ; fruit small ; color yellow when ripe ; juice rich and musky ; great bearer.

28. MUSK DRONE.—Ripens the end of August or beginning of September ; color yellow when ripe ; flavor rich and musky ; should be eaten off the tree ; is apt to get dry and mealy when over ripe ; keeps only a few days. Is a great bearer.

29. RED ORANGE.—Ripens about the beginning of August ; color greenish, but when ripe, the side next the sun becomes tinged with purple ; flesh melting, and juice sugary, with a little perfume.

30. HANGING LEAF.—An esteemed Clydesdale fruit. Fruit almost round ; color beautiful red and yellow ; of a delicious sweetness. Tree hardy, and well adapted for the orchard.

31. SCOTCH BERGAMOT.—Fruit large; color yellow and red; flesh tender and juicy.

32. MUSKED BONCHRETIEN, *Gratioli*, *Cucumber*, or *Spinola's Pear*.—Color red on one side and white on the other; pulp rather tender; juice a good deal perfumed. A great bearer, and excellent fruit.

33. ELTON.—A seedling, growing at Elton. Recommended by Mr. Knight. Middle-sized fruit, oval, and rather flattened at the ends; color red and yellowish; ripe from the end of September till the middle of October. A great bearer, and forms an excellent standard tree. The fruit is always without seeds, and almost always without internal cavity. If trained to a wall it becomes very large; but is then good for nothing. As a standard, it grows and bears well. The original tree stands upon its own roots, in an orchard of seedling pear-trees, in the parish of Elton, in Herefordshire. Mr. Knight has ascertained its age to be about 140 years, and describes it too as still indicating youth and vigour; and calculates that, if not destroyed by accident, will live for three centuries, as he thinks it has hardly yet attained its middle age. This pear has been recommended by the Hort. Soc. as deserving general cultivation. It comes early into fruit, and combines nearly all the fine flavor of the Bergamots, with much of the melting softness of the *Beurré*.

34. SAFFRON.—Well-shaped fruit, rather large; tree hardy, and rather a good bearer.

AUTUMN PEARS.

Arranged in their Order of Ripening.

35. CASSOLETTÉ, or *Green Muscat*.—Ripens the latter end of September. Fruit rather small; color greenish, with dark specks; juice richly perfumed; an esteemed fruit. Tree rather delicate.

36. AVORAT, or *August Muscat*.—Ripens the beginning of September. Skin smooth; color whitish yellow; juice rich, sugary, and perfumed; and is esteemed one of the best summer pears yet known. Is a great bearer.

37. TILLINGTON PEAR.—Originated at a village of that name, near Hereford, from a seed of the autumn Bergamot, impregnated with the pollen of the *Jargonelle*. It is of the shape and size of the *Doyenne gris*, but more perfectly rounded at the head. Stalk short, with a disposition to fleshiness at its insertion. The skin is dull green on the shaded side, with a dull brick-dust red where exposed: the whole a good deal russeted. Flesh white, with a little grit at the core; particularly sweet and rich, though not juicy. Ripens in the middle of November, but remains a considerable time without spoiling.

38. GREAT ONION.—*Brown Admiral*, or *King of Summer*.—Ripens about the beginning of September. Color brownish next the sun; a middling bearer; tree nardy.

39. ORANGE MUSK.—Ripens with the last. Skin green; flesh melting and juicy.

40. POIRE DU POUCHET.—Ripens with the last. Flesh soft and tender; juice sugary.

41. ROSE, *Thorny Rose*.—Ripens with the last. Shape resembling the *King of Summer*, but much larger; color yellowish green, rather inclining to red towards the sun; juice musky.

42. PERFUMED.—Ripens with the last. Color deep red, spotted with brown; flesh melting, but dry; flavor rather perfumed.

43. SALVIATI.—Ripens about the middle of September. Color red and yellow next the sun, white where shaded; flesh tender; juice sugary and perfumed.

44. WHITE BEURRÉ.—Ripens about the beginning of September; keeps only a few days; a fine table pear.

45. ROSE-WATER.—Ripens about the latter end of September. Color brown, skin rough; juice very sweet, tasting like rose-water.

46. RUSSELET.—Ripens with the last. Flesh soft and tender; juice agreeably perfumed.

47. KEATHER.—A Clydesdale fruit. Color green; snape oblong. Hardy tree; fit for orchards.

48. ELSINE, (*Awl*) *half*. or *Goodman*.—A Scotch fruit. Size small, long, and flat at one end; color green and yellow; flavor sweet, dry, and hard. A great bearer.

49. FRENCH CARNOCK.—A fruit of middling qualities.

50. DRUMMOND, or *Late Scotch Carnock*.—Color bright red and yellow. Should be eaten off the tree; is apt to get dry and mealy if kept many days.

51. VICAR.—Shape oblong; color yellow, red, and striped; flesh tender; flavor sweet and musky; rather dry in eating, particularly if too ripe.

52. ROYAL ORANGE BERGAMOT.—Color yellow, sometimes striped or tinged with red.

53. GREAT MOUTH-WATER.—Ripens about the end of September. Flesh melting, and full of juice. Tolerable bearer.

54. PRINCE'S PEAR.—Ripens with the last. Juice very high flavored. Is a great bearer.

55. SUMMER BERGAMOT.—Ripens with the last. Often called *Hamden's Bergamot*. Flesh melting, highly perfumed. Good bearer.

56. AUTUMN BERGAMOT.—Ripens in the beginning of October; keeps some weeks; is smaller than the last; flesh melting, and the juice highly perfumed. It is a great bearer, and worthy of a wall upon an east or west aspect.

57. WILLIAMS' BONCHRETIEN.—A seedling from Berkshire, and known to have originated in the garden of a schoolmaster, at Aldermaston, in that county, about thirty years ago. A valuable pear for the market-gardeners. Is a great bearer, and succeeds the Windsor and Jargonelle, and bears well upon standards; it very much resembles the Summer Bonchretien. Color pale green and russet; very juicy; and of a pyramidal form.

58. SUMMER BONCHRETIEN, or *Gracioll*.—Very juicy; richly perfumed.

59. TRUE GOLDEN BEURRÉ.—Ripens in October. Resembles the brown Beurré in size; color reddish brown next the sun; is a very fine fruit; but does not keep long.

60. BEURRÉ CAPIAUMONT.—Introduced here from Brussels in 1820. Has been fruited by Knight, Braddick, and others. Fruit larger than the St. Germain's; pyramidal, tapering very much towards the stalk, which is long and slender; skin smooth, of a light cinnamon color, with a rich gold color showing through it; flesh white, perfectly white melting juice, rich and sugary; keeps till the end of November.

61. LA BONNE MALINOISE.—Introduced here in 1818 or 1819. Has fruited in this country, and is recommended as an excellent pear; skin of a dull pale yellow color, very much covered with smooth russet in large patches; flesh yellowish, melting, extremely rich and sweet; ripens towards the end of November.

62. THE FORELLE PEAR.—A German variety, brought into Flanders, and thence into this country. It is named Forelle (Trout) from its color, which resembles the rich spotting of that fish. In shape and size it much resembles the Doyenné Blanc, though perhaps a little more oval; skin bright yellow, very deep on the side next the sun; sprinkled with many small yellow spots, surrounded by a brown or reddish ring, which gives the fruit a singular appearance; flesh white, melting, without grit,

juicy and very sweet, without perfume. Ripens in November, and may probably keep a little longer.

63. **BEURRÉ DIEU.**—Originated by Van Mons, at Brussels, and introduced here about 1820. Fruit large, resembling a fine Summer Bonchretien in shape; skin smooth, of a bright citron color; flesh white and melting; juice rich and sweet; ripens in November, and will keep during the following month.

64. **THE URBANISTE.**—Originated by Count Coloma, and has been fruited here by Knight, Braiddick, and others; fruit egg shaped; skin pale green, inclining to yellow, much spotted with greenish spots, and sprinkled over with thin russet patches, particularly round the eye and stalk; flesh white towards the outside, but deepens to a reddish color towards the core. It is quite melting, juicy, and very sweet, but without perfume; keeps till October.

65. **BEURRÉ ROUGE, or Red Butter Pear.**—Ripens about the beginning of October; very melting, and full of rich sugary juice. Is one of our best sorts of buttery pears, if eaten off the tree.

66. **GREEN YAIR, or Green Pear of the Yair.**—Said to be indigenous to a beautiful seat on the river Tweed, about thirty miles from Edinburgh. Color green; size small; sweet and juicy. Should be eaten off the tree; does not keep many days; is a great bearer, and free grower.

67. **DOYENNÉ, Dean's Pear, Carlisle White Beurré, St. Michael's, Diana.**—Ripens about the beginning of October; juice cold and melting; and is a great bearer.

68. **VERTE-LONGUE, or Long Green.**—Ripens by the end of October; flesh melting and juicy.

69. **SWISS BERGAMOT.**—Ripens about the beginning of October. This pear is much grown upon the walls in Scotland; of middle size; color green, striped with red; juicy and high flavored. The tree is a very good bearer, if planted in good soil.

70. **MONSIEUR JOHN.**—Sometimes called *White*, and sometimes *Grey Monsieur John*. The difference of their color proceeding from the soil and situation in which they grow. Ripens in the latter end of October or beginning of November; juice rich and sugary; is upon the whole one of our best pears for this season.

71. **PENDER, or Knave's Pear.**—Ripens by the end of October; flesh fine and tender, very much sugared.

72. **VINE.**—Ripens in November; color dark red; flesh very melting, and full of a clammy juice.

73. **FLOWERED MUSCAT.**—Ripens about the end of November; is an excellent fruit; flesh very tender, and of a very delicate flavor.

74. **ROUSSILINE.**—Ripens about the latter end of October; color deep red, with spots of grey; flesh very tender and delicate; juice very sweet, with an agreeable perfume.

75. **MARQUESS.**—Ripens into eating in November; color yellow; but when it does not ripen to that color, seldom good, but if it does, the flesh will be tender and delicate, and very full of sugary juice. Cultivated at Little Chelsea above one hundred years ago.

76. **GANSELL'S BERGAMOT.**—Differing little from the autumn Bergamot, said to be the same thing improved by culture. Is a very high fruit when well ripened.

77. **RED DOYENNÉ.**—An old variety brought into notice by Mr. Knight; color red and pale green; is in eating in October and November. Great bearer and good fruit; tree extremely hardy, and excellently suited for cottage gardens. Mr. Salisbury mentions an old tree of this sort taken down at Strawhill, near Halifax, in 1779. which must have been above one hundred years old.

78. **GOLDEN BEURRÉ.**—Comes into use in October; color scarlet and gold; high flavored, and a great bearer, succeeds best upon an east aspect, and in a loamy soil

79. **MARIE LOUISE.**—This is one of the numerous seedlings which have been raised of late years in the Netherlands, and is one of the finest pears we have. The figure in this work, by Mr. Hart, junior, was taken from the private garden of Mr. Lee, of the Hammersmith Nurseries.) It is said to have been raised by the Abbé Duquesne, together with the Napoleon pear, and introduced into this country by the Hort. Soc., through Dr. Van Mons, of Brussels. Its general form is like that of the St. Germain, but tapering less towards the stalk; the skin is of a greenish yellow, deepening where exposed to the sun, or when full ripe to a rich yellow, clouded with light brown russet. The stalk is generally an inch and a half long; pale brown; flesh inclining to yellow; perfectly melting, with abundance of sweet juice. It varies in size according to circumstances; in favorable situations and good soils, it is about five inches long and three inches wide, and weighing about eight ounces. It is in perfection from the middle of October, till the middle or end of November, according to the place of its growth. It requires a south wall to bring it to perfection, but will not answer in this climate upon standards.

80. **SECKLE PEAR.**—This excellent pear is of American origin, and introduced here by the Hort. Soc. In shape it resembles the Swan's egg, but is a little longer. Stalk from half an inch to an inch long; eye not sunk, but even with the head of the fruit; skin of a greenish olive color, often washed with much dull or bronze red on the side exposed to the sun, and sometimes slightly streaked with a lighter red; flesh yellow, very fine in texture, melting, juicy, and sweet, with a delicate and extremely powerful bergamot perfume; it is in this perfume, that the character of this pear differs from all others, and which has caused it to be so highly extolled in America. With us it is in perfection about the end of October and beginning of November, but is much earlier in its native country. It ripens upon espaliers or standards in very favorable places, but its merits deserve a wall in general.

81. **CHARLES D'AUTRICHE.**—Another new variety of pear from Dr. Van Mons; fruit rather large; stalk about an inch long; eye in a confined cavity, not deeply sunk; skin greenish yellow, profusely sprinkled with brown spots, and partially russeted; flesh melting, white, very juicy, with a rich high flavor, but with little or no perfume; comes into eating about the middle of November, requires a wall of an east or west aspect to bring it to perfection; fruit beautiful and good.

WINTER DESSERT PEARS,

Arranged in their Order of Ripening.

82. **CRASSANNE.**—Comes into eating about the latter end of December. This is an excellent fruit, and is esteemed the best of all the Bergamots. It is highly flavored when fully ripened, of a roundish moderate size, and greyish color, and covered with small brown specks. It is the best keeper of all the bergamots; none of them being good keepers. It requires and deserves a south wall, although we have had it in tolerable perfection upon an almost north aspect. It succeeds best in a strong rich loamy soil; seldom succeeds upon standards.

83. **LANSAC, or Dauphinc.**—Is in eating about the beginning of December; flesh tender, yellow, and melting. The juice is sugared, and a little perfumed.

84. **ST. GERMAIN.**—Is in eating from December till February; color russet green; flesh melting and very juicy, which, in a dry season, or if planted in a dry soil, is highly flavored. It is an excellent bearer when planted as a dwarf standard

and comes in succession after the other pears of the same sort on walls are over. In good soils it comes of a large size and keeps well.

85. WINTER ACHAN.—*Grey Achan*, *Red Achan*, and *Black Achan*, varieties of the same fruit, probably arising from soil and situation. The varieties are much esteemed in Scotland, and generally cultivated. It is supposed to be of French origin, but must have been introduced very early into that country. It is of middling size when a great crop, but swells to a largish fruit when a middling one; is a great bearer, and keeps well; it has a sweetish and rather peculiar flavor.

86. MARTIN SEC, or *dry Martin*.—Is in eating about the middle of December, is much like the Russelet in shape and color; flesh breaking and fine; and the juice sugared, with a little perfume.

87. AMADOT.—In eating about the middle of December; is rather dry, but high flavored.

88. EPINE D'HIVER, or *Winter Thorn*.—Is in eating by the latter end of December; pulp tender and buttery, of an agreeable flavor; sweet juice, highly perfumed.

89. LITTLE LARD, or *Wonder of Winter*.—Is in eating by the end of December, and is reckoned one of the best fruits in this season; flesh melting; juice much sugared, and has an agreeable and musky flavor.

90. LOUIS-BONNE. *Good Louis*.—Is in eating about the middle of December; flesh extremely tender, and full of a very sweet juice; esteemed an excellent fruit.

91. L'ESCH ASSERIE.—Is in eating about the beginning of January; flesh melting and buttery; juice sugary, with a little perfume. It bears best on standards.

92. PASSE COLMAR.—Originated by M. Hardenpont of Mons. Fruit as large as a Colmar; more tapering towards the stalk; skin pale green, slightly marked with red on the side next the sun, and sprinkled with very small green spots; flesh yellowish, melting, though not buttery; very juicy, and extremely sweet; keeps till the end of December, and even later.

93. THE BEZY VAET.—Originated by M. Parmentier, at Enghien. It has fruited in the gardens of Lord Henry Fitzgerald, at Thames Ditton. Fruit resembling the swan's egg in form, but larger; skin dull green, sprinkled with a little russet; flesh yellowish, perfectly melting remarkably sweet, and very agreeably perfumed; is an abundant bearer, and is said by M. Parmentier to keep till April, but does not appear to keep with us beyond the end of November or middle of December.

94. THE BEURRÉ D'AREMBERG.—Cultivated on the continent. This pear is stated to keep till the beginning of May; with us it is not found to keep beyond the middle of November. Thus a difficulty presents itself in giving any description of fruits, at least as to their time of keeping. It is a well ascertained fact, that apples and pears, in one soil and situation, will remain good till April and May, while the same variety cultivated in a different soil or situation, will become mealy and insipid in the end of October, and often decay altogether.

95. COLMAR.—Is in eating about the beginning of January; flesh tender, and juice highly sugared. Fruit large, long, and of a greenish yellow color, when fully matured; for to be in perfection, requires a good wall and good soil; it is not in all seasons that it really comes to full maturity here. It is not a great bearer, rather otherwise; it is a good keeper.

96. BRIER-BUSH.—A Scotch fruit; rather small, firm, and of good taste; ripens in most seasons.

97. ROUND WINTER.—A Clydesdale fruit; an excellent winter pear.

98. AMBRETTE.—Comes into eating about the beginning of January; flesh quite melting, and full of highly-perfumed juice. It is esteemed an excellent pear.

99. VORGOULEUSE.—Comes in by the first of January; is esteemed one of the best winter pears. It requires a good soil and situation; if in a cold one, or in a cold wet season, it is very apt to crack before it becomes ripe. The flesh is melting, and full of rich sweet juice.

100. CHAPMAN'S.—Resembles the *Passe Calmar*; of American origin, introduced in 1815; rather small, smooth; russet color; is in use from December till May Bears on young wood, like a *Morella* cherry.

101. SPANISH BONCHRETIEN, or *Autumn Bonchretien*.—Is in eating in January; large fine pear; flesh breaking, juicy and sweet.

102. ST. AUSTIN.—Is in eating from the middle to the end of December, and continues good till March; flesh tender, but not buttery; juicy, and rather sharp.

103. WILDING OF CASSOY, or *Small Winter Butter Pear*.—Fruit small; flesh melting, and juice very sweet and rich; is in eating in January, and is an excellent bearer on standards.

104. BROWN, ST. GERMAINS.—In eating from December till April. High flavored; bears well on dwarfs or standards, and comes in after the wall-fruits of the same sort are over.

105. PEAR D'AUCH.—Introduced by the Duke of Northumberland in 1780. It much resembles the *Colmar*, but is fuller towards the stalk; continues good from December till April, and is one of the best winter pears we have.

106. MARTIN SIRE, or *Lord Martin*.—Is in eating in January; flesh breaking, full of juice, which is very sweet, and somewhat perfumed.

107. WINTER ROUSSELET.—Is in eating about the end of January; flesh buttery and melting, and generally full of sweet juice.

108. ROUND WINTER.—A Clydesdale fruit, much esteemed for winter use.

109. HOLLAND BERGAMOT, or *Chenies Bergamot*.—Keeps from the end of January till April; flesh half buttery and tender; juice high-flavored. Is altogether an excellent pear.

110. BROWN BEURRÉ, or *Beurré de Roy*, or *Red Beurré*.—In eating from October till December or January; color reddish brown on the side next the sun, and yellowish where shaded; flesh melting and full of rich juice; an excellent pear.

111. GERMAN MUSCAT, or *Muscat d'Allemande*.—Is in eating from February till April or May; flesh buttery and tender; juicy and high-flavored.

112. SWAN'S EGG.—A good fruit in tolerable good soil; a great bearer; is a good keeper; egg-shaped, and greenish.

113. PEAR OF NAPLES, or *Easter St. Germain*.—Is in eating in March; juice sweet, and a little vinous.

114. BONCHRETIEN, or *Winter Bonchretien*.—Is in eating from March till June; flesh tender; very full of rich sugared juice; fruit large size.

115. CHAUMONTELLE, *Winter Beurré*.—An excellent table pear, and keeps well. Duhamel has stated, that the original tree of the *Chaumontelle* was alive and in health about the end of the last century; and Knight supposes the tree to be still living.

116. BERGAMOTTE DE PASQUE, or *Terling*, *Amoselle*, *Paddington*, and *Tarquin*.—Comes into eating about April, and lasts till June; fine handsome fruit; green when gathered, and when ripe of a yellowish straw color; makes a very handsome appearance at table.

117. ST. MARTIAL, or *Angelique*. (*The Angelic Pear*).—Is in eating in March; flesh tender and buttery; juice very sweet.

118. BROWN ST. GERMAIN.—Continues from the end of December, till the end of March.

119. LA PASTORALE.—Is in eating in March; flesh tender and buttery; juice rich; very sweet.

120. GOLDEN BEURRÉ.—Was introduced from Burgundy by Marshal Conway, and first cultivated in this country, at his seat, Park-place, near Henley-upon-Thames; color beautiful scarlet next the sun, and yellow upon the shaded side; flesh melting; juice high-flavored; ripens in October.

121. MUIR FOWL-EGG.—An esteemed Scotch fruit. Tree hardy; bears well upon standards; good bearer; color green and brown.

122. JOHN MONTEATH.—Another esteemed Scotch fruit; an excellent bearer upon standards or walls.

123. LONGUEVILLE.—An old Scotch fruit. An excellent bearer either upon walls or standards. Probably has been brought from France originally by some of that ancient family.

124. GREEN SUGAR.—An esteemed Scotch fruit. Smallish size, juicy, and rather well-flavored; great bearer upon standards.

CULINARY PEARS,

Arranged in their Order of Ripening.

125. POIR PORTRAIL, or *Gate Pear*.—An excellent culinary fruit.

126. UNICORN.—A beautiful fruit; colour red and yellow; rather austere.

127. LE BESIDERI, or *Wilding of the Forest of Heri in Bretagne*.—Handsome upright tree.

128. BLACK PEAR OF WORCESTER, or *Parkinson's Warden*, or *Pound Pear*.—Good bearer, and keeps long.

129. LA DOUBLE FLEUR, *Double Flowering*.—Large flat beautiful pear; skin smooth; color yellow on one side, and blueish on the other. It is the best pear to preserve, taking a fine red color from the fire.

130. BLOODY.

131. POU MEG.—An esteemed Carse of Gowrie fruit, (Scotch) Hardy tree, and good bearer.

132. CATELLAC.

133. UNION, or *Uvidale's St. Germain*, *Pickering's St. Germain*.—Free growing tree.

134. FRANC REAL, or *Golden End of Winter*.

135. SPANISH RED WARDEN.

PEACHES.

PEACH, *Amygdalus Persica*, *Linnaeus*,—belongs to the class and order *Icosandria Monogynia*, and natural order *Rosacæ*.

Is a native of Persia, and was introduced into Europe by the Romans, during the reign of Claudius, and is described by Columella, and afterwards by Pliny. The former says, that when it was first brought into the Roman Empire, it possessed deleterious qualities. Knight, however, supposes those peaches to have been only swollen almonds, or imperfect peaches, and which are known to contain the Prussic acid, which ope-

rates so unfavorably on some constitutions. The peach was deemed unwholesome in Media; but when planted in Egypt, it became delicious and salubrious. In Asia, it has been cultivated from time immemorial; but when it was introduced into Greece is not known. It is still cultivated in Italy, and is there grown on standards superior to any other in Europe. The Montreuil gardeners are noted for the fineness of their fruits, which they grow upon low walls. They divide their peaches into two classes: paxies, and peaches. The first class, or paxies, we call clingstones, from the flesh adhering to the stone, and are with us held in least estimation, for want of sufficient heat to ripen them properly. In France they are esteemed the best as well as in America. The second class, or peaches, are by us distinguished by the appellation of free-stones from the flesh readily coming away from the stone, and are by us held in the highest estimation, while, on the other hand, the French and Americans consider them to be inferior. The Americans are said to feed their pigs with the free stones, and to use the clingstones or paxies for eating only.

There the whole population has been maintained for several generations by the cultivation of this fruit, which is their sole occupation. The late Sir Joseph Banks very justly remarked, that, "it is there alone where the true management of this delicious fruit can be studied and attained; for it is impossible, from written precepts, to acquire the whole art. The modes of winter and summer pruning, are varied, not only according to the differences of soil and exposure, but even according to the state and constitution of every individual tree." Like the American peach-growers, the French cultivate many sorts they have never budded, but always reared from the stone, and others they bud on stocks of a sort of half wild peach, called *Peche de Vigne*. In consequence of this arrangement of one species of fruit coming under the management of individuals for many generations, they are brought to a degree of perfection, which can never be attained in a garden where fruits of all sorts, and a variety of other equally important duties fall to the care of a gardener.

In the United States, particularly in the middle and southern provinces, it is no uncommon circumstance for the owners of some of the peach orchards to be possessed of such a number of peach-trees as are sufficient, after fermenting and distilling the juice to produce from fifty to a hundred barrels of peach brandy. The manufacturing of this liquor, and the feeding of hogs, being the principal uses to which the peach is applied in those countries. In the vicinity of Buenos Ayres, in South America, where fire-wood is scarce, peach-trees are raised from the stone chiefly for the purpose of burning.

Knight is of opinion that the peach may yet, by proper cultivation, be sufficiently hardened as to be naturalized to the climate of England, so as to succeed even as a standard in favorable situations.

There are of peaches, as well as all other fruits, long catalogues of names. Parkinson, in 1629, enumerates 21 sorts. Miller, in 1750, described 31 varieties. In the Nursery Catalogues, both of Paris and London, there are enumerated nearly 100 varieties; and the Horticultural Society's Catalogue enumerates 224 sorts.

In the following lists we will confine ourselves to such as are well known, and sufficiently described.

1. **WHITE NUTMEG.**—Fruit small, round, white; juice sugary; is chiefly esteemed for being first ripe; ripens in July.

2. **RED NUTMEG.**—Fruit much larger than the last, round; bright vermilion; flesh white, red next the stone; is a great bearer, and ripens soon after the last; is esteemed a better fruit.

3. **EARLY AVANT.**—Fruit large, red, has an agreeable flavor, and ripens in August.

4. **SMALL MIGNONNE**, or *Early Mignonne*.—Fruit middle-sized, round; very red on the side next the sun; flesh juicy, and of a vinous richness; pulp white, and red towards the stone; ripens about the beginning of August.

5. **EARLY ANNE**.—Said to have originated from seed at Pusey, in Berkshire, and named after Mrs. Anne Dunch, of that place. Fruit small, round; very white, both in skin and flesh; rather rose-colored, when fully ripe and exposed to the sun; high flavored; one of our best early peaches, and should hold a place upon the walls of every garden; ripens the beginning of August.

6. **EARLY PURPLE**, *Pourpre Native*.—Fruit large, round; fine deep red or purple; flesh white, very red next the stone; juicy and high flavored; is an excellent fruit; ripens about the middle of August.

7. **NEAL'S EARLY PURPLE**.—Approaching the last in point of merit, but inferior; ripens about the middle of August.

8. **SUPERB ROYAL**.—Fruit large; high colored when fully exposed to the sun; flesh white, juicy; a fine fruit; ripens about the middle of August.

9. **GREAT MIGNONNE**, *Grosse Mignonne*, or *Large French Mignonne*.—Fruit large, round; greenish yellow where shaded, rose-colored where exposed to the sun; flesh white, sugary, high flavored. One of our finest peaches, but rather tender; is generally wrought upon a peach or apricot stock; ripens by the middle of August.

10. **WHITE MAGDALEN**.—Fruit rather large, round; of a yellowish white, with sometimes delicate red stripes; flesh white to the stone; an exceedingly tender tree. but in a peach-house one of our finest; upon the walls it ripens about the middle of August.

11. **EARLY NEWINGTON**, or *Smith's Newington*.—Fruit middle size, roundish; fine red; flesh white and firm, red at the stone, to which it is partially attached; ripens about the end of August.

12. **BELLE CHEVREUSE**.—Fruit middle-sized, oblong; red and yellow; flesh also yellow; juice rich; fine fruit, and tree a good bearer; ripens by the end of August.

13. **EARLY ADMIRABLE**.—Fruit large, round; reddish and white; flesh white, red towards the stone; flavor high and vinous.

14. **EARLY VIOLETTE**.—Of French origin. Fruit large; ripens about the end of August.

15. **RED MAGDALEN**.—Fruit large, round; fine red; flesh firm, white, very red near the stone; flavor exquisitely rich; ripens about the end of August. Tree extremely subject to mildew in all situations.

16. **MONTAUBAN**.—Fruit middle size; deep red, inclining to purple next the sun, pale towards the wall; flesh melting; rich juice; ripens by the end of August. Tree a great bearer.

17. **ROYAL CHARLOTTE**, *Queen Charlotte*.—Fruit above the middle size; yellowish white; very fine fruit; ripens about the end of August.

18. **DOUBLE MOUNTAIN**.—Of French origin. Fruit large; ripens about the end of August.

19. **CHANCELLOR**.—Fruit middle-sized, oval; flesh white and melting; ripens about the end of August. Tree tender; will not succeed on common stocks, should be wrought upon peach or apricot stocks.

20. **BELLEGRADE**, *Gallande*.—Fruit very large, oblong rather than round; deep purple; flesh white and juicy, red near the stone; flavor excellent; ripens about the middle of September.

21. **GALLANDE**, *Ronald's Early Gallande*.—Fruit large; fine flavored; flesh white, red towards the stone; originated at the Brentford Nursery; ripens about the beginning of September.

22. MALTA, *Italian Peach*.—Fruit middle-sized, of an irregular form; deep green and red marbled; beautiful fruit; flesh white, deep red near the stone; fine flavored, and a good bearer; ripens about the beginning of September.

23. BOURDINE, *Narbonne*.—Fruit large, round; dark red; flesh white, quite red at the stone; flavor good; ripens about the beginning of September; when old it is an excellent bearer, and the fruit becomes improved. It answers well in favorable situations as a standard, producing its fruit ripe in October.

24. ROYAL GEORGE.—Fruit largish, round; flesh melting, rich; sets with less air than most other peaches; is extremely well calculated for forcing; ripens about the middle of August; is a great bearer.

25. ROYAL GEORGE, GRIMWOOD'S.—Fruit large, round; flesh melting; high flavor; a tree apt to mildew; ripens about the middle of August.

26. ALBERGE YELLOW.—Fruit middle-sized, longish; deep red and yellow; flesh yellow, and red near the stone; flavour good; ripens about the beginning of September.

27. VIOLETTE HATIVE. — Fruit very large; yellowish red; ripens about the beginning of September.

28. LATE VIOLET.—Fruit very large; violet marbled with red; flesh pale yellow; ripens about the beginning of September.

29. ROSANNA.—Fruit middle-sized, longish; deep red and yellow; flesh yellow, and red towards the stone; flavor good; ripens beginning of September. This, as has been observed by Duhamel, is a variety of the Yellow Alberge, but has not been sufficiently distinguished from it by the British gardeners: it ripens a little later than the Alberge, and is superior to it in quality. This fruit has ripened upon a standard in the nursery grounds of Mr. Joseph Kirk, Brompton; and in favorable situations might be found to answer as such.

30. ROYAL KENSINGTON.—Introduced into the Royal Gardens at Kensington, in 1780. Fruit above middle size, roundish; high red and yellow; flesh juicy and rich. One of the best peaches we have, and is not apt to mildew or blight; great bearer; ripens about the beginning of September; resembles the old Royal George.

31. RAMBOUILLET, or *Rumbullion*.—Fruit middle-sized, roundish, deeply furrowed; fine red and bright yellow; flesh deep red at the stone, melting, fine flavored; ripens about the beginning of September.

32. NIVETTE.—Fruit large, roundish; bright red towards the wall and pale yellow in the shade; flesh greenish yellow, and reddish near the stone; juicy and well-flavoured; ripens about the middle of September.

33. NOBLESSE.—Fruit very large, round, pale yellow, inclining to be reddish next the sun; flesh juicy and rich. It is a great bearer, and one of our finest peaches; ripens about the middle of September. (The figure in this work, by Mr. Hart, junior, was taken from a tree in the nursery of Mr. Mackay, of Clapton.)

34. SPRING-GROVE.—Originated by Knight, at Downton Castle, in 1814, from the large Mignonne and Nutmeg peaches. Fruit middle-size, round; dark red next the sun, bright yellow on the shaded side; flesh firm, but melting; of exceedingly good flavor. Tree rather tender; succeeds best upon an apricot stock; is a good bearer, and ripens about the middle of September.

35. ACTON SCOTT.—Another which originated with Knight, at Downton Castle, from the Noblesse and Nutmeg peaches, in 1814. Fruit middle size, round; red and white; delicate looking fruit; flesh rich, juicy, and sweet. Tree hardy, not apt to mildew or gum; good bearer; ripens about the middle of September.

36. INCOMPARABLE, *Pavie Admirable*.—Fruit very large, irregular; an esteemed fruit; ripens about the middle of September.

37. **VANGUARD.**—Fruit large, roundish; not high colored; flesh melting and well flavored; ripens about the end of September.

38. **VINEUSE.**—Fruit middle size, round; red all over; flesh white, red towards the stone; high flavored. Tree a good bearer; ripens about the end of September.

39. **LATE PURPLE, *La Pourpre.***—Fruit large, round; dark red and yellow, approaching to purple; flesh melting, white, red towards the stone; sweet and high flavored; ripens about the end of September.

40. **FLAT PEACH OF CHINA.** This singular peach is thus described in the Transactions of the Hort. Soc.: “This fruit is of truly singular form, and perhaps will be best described as having the appearance of a peach flattened by pressure at the head and stalk; its upright diameter, taken through the centre, from eye to stalk, being eleven-sixteenths of an inch, consisting wholly of the stone, except the skin; that of its sides is one inch and one-eighth; its transverse diameter being two inches and a half. The head of the fruit is cracked in such a manner as to look like a broad and rather hollow eye, of an irregular five-angled (or lobed) shape, surrounded by the appearance of remains of the leaves of a calix; the whole surface of this eye is roughly marked with small irregular warted lines, like the crown of a medlar. The color of the skin of the fruit is pale yellow, mottled, or rather speckled with red on the part exposed to the sun, and covered with a fine down. The flesh is pale yellow, having a beautiful radiated circle of fine red surrounding the stone, and extending far into the fruit. The stone is flatly compressed; small, rough, and irregular. The consistency and flavour of the flesh are that of a good melting peach, being sweet and juicy, with a little noyau flavour, or bitter aroma. It was introduced into this country by Mr. Joseph Kirke, of the Brompton Nursery, from Java, under the name of the Java peach, to which country it had no doubt been carried from China. Plants of the same fruit have been introduced from that country by the Hort. Soc. Its real merits will not warrant its admission into small gardens, or where fine fruit only is an object. Its singularity, however, claims a place in the collections of the curious.

41. **TETON DE VENUS, *La Teton de Venus, or Venus's Breast.***—Fruit middle-sized, irregular; faint red next the sun, straw color next the wall; flesh white, melting, red towards the stone; flavor rich and sugary. Tree a shy bearer; ripens its fruit about the end of September.

42. **BLOODY PEACH, *Sanguinole.***—Fruit middle-sized; deep red next the sun; flesh also deep red; seldom succeeds upon the open walls, and even in favorable seasons is fit for preserving or culinary uses only. When in a peach-house, it is much improved, but is seldom met with, except in large collections of peaches, as there are so many preferable. It ripens about the end of September.

43. **DOUBLE SWALSH.**—Fruit very large. It is one of our finest large late peaches; ripens about the end of September.

44. **YELLOW ADMIRABLE.**—Fruit middle-sized, roundish, oval; bright yellow; somewhat like an apricot, both in color and flavor. It is often called the *Apricot Peach*. It is an excellent fruit; and ripens about the end of September.

45. **BRADDICK'S AMERICAN.**—Fruit large, irregular; purplish and orange; flesh melting, musky, and juicy. It does not appear suited for the open wall, unless under very favorable circumstances. In the peach-house it is a showy and valuable addition; is a good bearer; and ripens on the walls about the beginning of October.

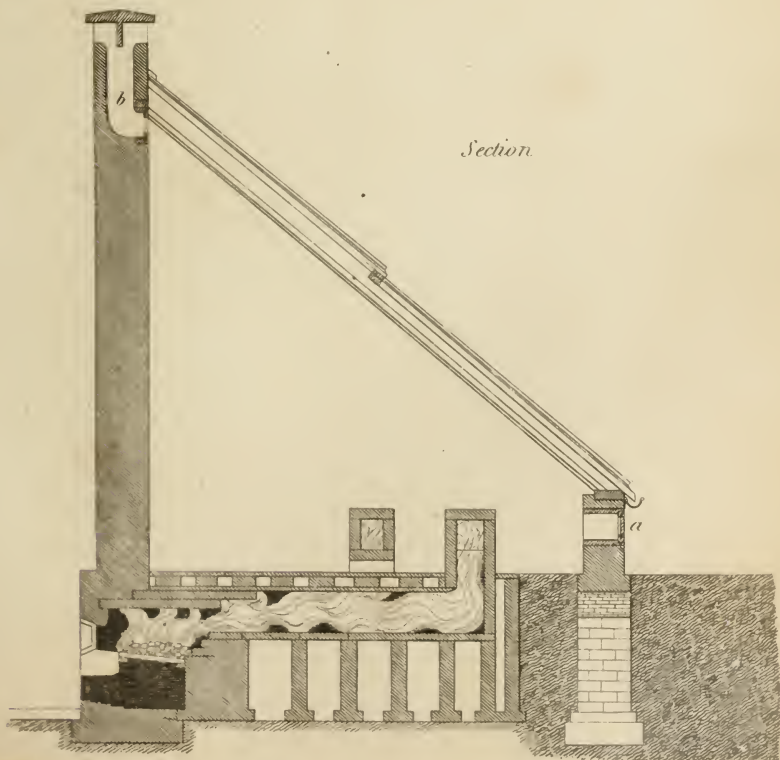
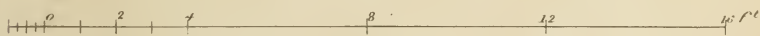
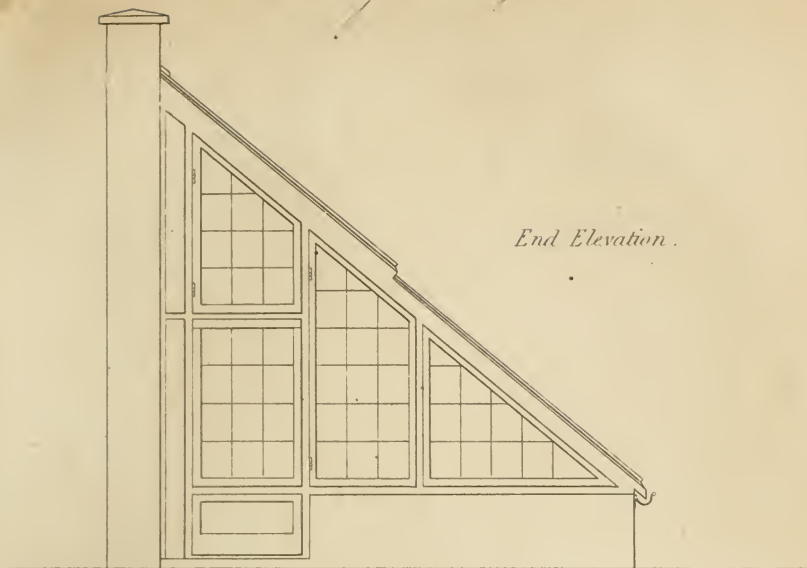
46. **LATE ADMIRABLE.**—Fruit rather large, round; bright marbled red; flesh greenish, white veined, with red at the stone, to which it is firmly attached; ripens about the end of September.

DAHLIA FLORA PERFECTA.



Drawn by J. Talbot from
W. Mackay's Nursery, Clapham.

Ferrous Linery.



47. **BELLIS, *La Belle de Vitry*.**—Fruit middle-sized, round; pale red towards the sun; flesh white, red towards the stone, to which it is attached; ripens about the end of September.

48. **PORTUGAL.**—Fruit middle-sized; beautiful red towards the sun, generally spotted; flesh firm and adhering to the stone; ripens about the end of September.

49. **BUCKINGHAM MIGNONNE.**—Fruit large; red and white, flesh juicy, white, red towards the stone, to which it is not much attached.

50. **GOLDEN, *Orange*.**—Fruit above the middle size, round; crimson, with rich purple and gold; a beautiful fruit; flesh deep yellow, crimson near the stone; fine fruit; ripens about the end of September; flesh attached to the stone.

51. **PERSIQUE.**—Fruit large, oblong; fine red; flesh firm, white, red near the stone; juicy and highly flavored. Tree a shy bearer; ripens about the end of September.

52. **OLD NEWINGTON.**—Fruit large, roundish; fine red, particularly next the sun; flesh white, red near the stone, to which it is attached, an excellent fruit; ripens about the end of September.

53. **CHERRY PEACH.**—Fruit small, globular; red and whitish; flesh melting; tolerably well-flavored; a handsome fruit; ripens about the end of September.

54. **MILLET'S MIGNONNE.**—Fruit middle-sized, roundish; high-colored towards the sun; fine-flavored; ripens about the middle or end of September.

55. **CATHERINE.**—Fruit large, round; dark red towards the sun; flesh melting, and full of rich juice; flesh adhering to the stone; is much improved by being gathered two or three days before it is eaten, as it does not always sufficiently ripen upon the walls. It is a great bearer, and excellent for the purpose of preserving in brandy. It ripens about the beginning of October; is worth room in a large peach-house, where there are also many other preferable peaches grown.

56. **MONSTROUS PAVIE, or *Royal Pavie*.**—Fruit exceedingly large, globular; fine red and greenish white; flesh white, melting, deep red towards the stone, to which it firmly adheres; pretty juicy, and well-flavored; ripens about the beginning of October

NECTARINES.

NECTARINE, *Amygdalus Persica, variety*,—belongs to the class and order *Icosandria Monogynia*, and ranks in the natural order *Rosaceæ*.

Is a variety of the peach, although former botanists considered it a distinct species, under the name of *Amygdalus Nusi-Persica*, from the fruit, in its unripe state, resembling in smoothness, color, and size, the covering of the walnut. The name of nectarine, is supposed to be derived from nectar, the fancied drink of the gods. The circumstance of both peaches and nectarines growing upon the same tree naturally, and even the same fruit partaking of the characters of both, justifies modern botanists in considering them merely as varieties of the same species. The first instance of which we have any account of these fruits being observed growing upon the same tree, is in a communication between Peter Collinson, Esq., and Linnæus. The second occurred at Londesborough, the then residence of the Earl of Burlington, and was visited by several scientific people of the day. The third instance is com-

memorated by a painting in the possession of Mr. Lec, accompanied with a dissection of the two fruits. The fourth instance was observed at East Sheen, in the garden of William Gilpin, Esq.; of this there is also a painting by Mr. Hooker. The fifth was discovered on the wall of Sir John Arundel, at Huntingdon, in June, 1802. A sixth instance occurred in the garden of Mr. Wilmot, at Isleworth. The tree in this garden which produces fruits with both smooth and downy coats, or in fact, peaches and nectarines, is the Royal George, and seldom fails to produce them annually. It does not appear, that ever any distinct marks were observed upon either, excepting in the smoothness or roughness of the skin only; the essential characters of their flowers, leaves, wood, and habit of growth being the same. They are supposed to possess finer flavor than peaches, and even to surpass every other fruit in that point. It is a native of the same country with the peach, and probably travelled into this country by way of Italy. It is cultivated in all latitudes in which the peach is grown, and succeeds equally well in all.

There are many varieties of nectarines, but they are not so numerous as peaches. The Horticultural Society's Catalogue enumerates 72 sorts.

1. FAIRCHILD'S EARLY.—Fruit smallish, globular; beautiful red color next the sun; flesh firm, and highly flavored; ripens about the beginning of August.
2. ELRUGE.—Said to have been first cultivated by Gurle, a nurseryman, at Hoddesden, in the time of Charles the Second; fruit middle size; dark red next the sun, pale yellow on the opposite side; flesh soft, melting, fine flavor; ripens the end of August, or beginning of September. A tree of this sort is described in the Hort. Trans. as growing in the garden of Lord Selsey, at West Dean, which covers a trellis, in one of the peach-houses, of six hundred and thirty-eight square feet; supposed to have been planted 1793, and continues to produce excellent crops of fruit.
3. SCARLET.—Fruit rather small; fine scarlet next the sun, pale red next the wall; ripens about the end of August.
4. ITALIAN, or *Brugnon*.—Fruit middle-sized; deep red next the sun, approaching to black, pale yellow on the side next the wall; flesh adhering to the stone; fine flavor; ripens about the end of August.
5. EARLY NEWINGTON.—Fruit above the middle size; fine red next the sun, yellowish on the other side; flesh exceedingly high-flavored, adhering firmly to the stone, and is supposed one of the finest of the family; ripens about the end of August.
6. WHITE NECTARINE.—Fruit above the middle size; cream-colored next the sun, greenish white next the wall; roundish; good flavor; but rather a shy bearer. Tree less subject to canker or blight than any of the species; succeeds better than most others upon a chalky soil; ripens about the middle of September.
7. TEMPLE'S.—Fruit middle-sized; pale red next the sun, yellowish towards the wall; flesh rich and juicy, separating easily from the stone; ripens about the middle of September; when over-ripe it shrivels, and then the flavor is exquisite.
8. DUC DE TILLO.—Is of Spanish origin; fruit larger than any of the species; dark, approaching to purple next the sun, and bright red on the under side, parting readily with the stone; flavor exquisite. Tree hardy, and a great bearer; deserves a place in every peach-house as well as on the walls; ripens about the middle of September.
9. VERMAH, *Late Green*, or *Peterborough*.—Fruit middle-sized, round; always of a greenish color; flesh firm and well flavored; ripens about the end of September or beginning of October.
10. RED ROMAN.—Fruit large size; dark red next the sun, yellowish next the wall; flesh rich and juicy; ripens about the middle of September; fine fruit.

11. LATE NEWINGTON.—Fruit middle-sized; red towards the sun, yellow next the wall; flesh rich and juicy; ripens about the middle of September. Forsyth remarks, that this nectarine has smooth leaves, and that the early Newington has jagged ones, which is one of the most essential differences by which these two fruits are distinguished.

12. VIOLET HATIVE, or *Violet*.—Fruit middle size; purple next the sun, pale yellowish next the wall; flesh juicy and good flavored; ripens about the middle of September.

13. GOLDEN, or *Yellow*.—Fruit, when in perfection, large, round; bright orange color, slightly tinged with red next the sun; flesh adhering to the stone, rather peculiar than high flavored; showy fruit; ripens about the beginning of October.

14. MURRAY.—Fruit middle size; dingy red, often almost black next the sun, pale greenish yellow next the wall; flesh parting freely from the stone, juicy and high flavored. Tree excellent bearer; ripens about the end of September.

15. CLAREMONT.—Fruit middle size; flavor excellent; ripens about the end of September.

16. COWDRAY, *White Nectarine*.—Introduced from Brussels by Antony Viscount Montague. Is different from the common white, or Flanders nectarine, in the peculiar length of its leaves, as well as being a much larger fruit; is perfectly white, and of exquisite flavor. Is sometimes called the White Brussels Nectarine; was first cultivated in the gardens of William Stephen Poyntz, Esq., at Cowdray Lodge, near Midhurst.

APRICOTS.

APRICOT, *Prunus Armeniaca*, Linnæus,—*Armeniaca vulgaris*,—belongs to the class and order *Icosandria Monogynia*, and ranks in the natural order *Rosacæ*. Apricots have long been considered a part of the genus *Prunus*, from which it is now thought more advisable to separate them, and make a new genus, under the name of *Armeniaca*.

The native habitat of this tree is not known with any degree of certainty. It is most probably a native of Asia. From its trivial name, it is supposed to have originated in Armenia, but Regnier and Sickler, assign its origin between the Niger and the Atlas; and Professor Pallas says, that it is found on all parts of the Caucasus, the mountains there being covered to the top with it. Grossier and Thunberg describe it as a native of China and Japan; the former naturalist says, that the Chinese possess many varieties of it, which they plant in pots for their rooms. He also states, that the whole of the barren mountains, to the west of Peking, are covered with it; and that the Chinese make lozenges from the clarified juice, which, dissolved in water, yields a cooling drink. It is the *Malus Armeniaca* of the ancients. It was introduced into Europe by the Romans, and brought from Italy to this country by Wolfe, a French priest, gardener to Henry the Eighth. It was cultivated here in 1562, and is noticed by Turner and Hakluyt. The definition of the name apricot, has given rise to a variety of opinions; Professor Martin has given the most simple and most probable. He observes, a tree, when first introduced, might have been called a *precox*, or early fruit, and gardeners taking the article *a*, for the first syllable of the

word, might easily have corrupted it to *apricocks*. Kyle of Moredun is the first who writes it *apricot*, all the earlier writers wrote it *apricocks*.

There are many varieties of this fruit. Parkinson enumerates six sorts, Rea seven. The French and English Nursery Catalogues contain about 15, that of the Horticultural Society 54, of which 27 are considered as cultivated in the British gardens, the remainder are cultivated on the continent. It is supposed that this list will be greatly reduced, as we become better acquainted with their fruits; at present they are not sufficiently known to identify the names of the two countries to any extent.

1. **EARLY MASCULINE**, or *Red Masculine*.—An old variety, cultivated here in Charles the Second's time; fruit small, round; red towards the sun, and greenish yellow towards the wall, or where much shaded; flesh tender, and of rather a tart taste, for which it is esteemed, as well as its being the earliest apricot we have. Tree rather slender, but an excellent bearer; fruit ripens about the end of July.

2. **ORANGE**.—Has been cultivated here before 1702. Fruit large; deep yellow or orange color, when fully ripe; flesh dry and insipid; better calculated for culinary purposes than for the dessert. It is considered the best for preserving, as it retains its color; fruit ripens about the middle of August. Tree good bearer.

3. **BLACK**.—Introduced by Sir Joseph Banks, and cultivated in his garden at Spring Grove, about 1790, from France. It is much esteemed by the French, but is considered by us as very inferior to any of the other varieties cultivated. Fruit small; black or dark violet; ripens about the middle of August, which is its only merit.

4. **TURKEY**, or *Large Turkey*.—Cultivated here before 1702. Fruit large, round; very deep yellow; flesh firm and dry; ripens about the middle of August.

5. **ALGIER**, or *White Algiers*.—Cultivated here before 1702. Fruit oval, flattish at the ends; straw colored; flesh juicy and high flavor; ripens from the beginning to the middle of August.

6. **BREDA**.—Introduced from thence to this country in 1702, and originally brought there from Africa. Fruit large, round; deep yellow; flesh soft and juicy; is an excellent fruit; ripens about the end of August. Tree hardy; a great bearer, and well calculated for standards.

7. **ROMAN**.—Introduced here before 1702. Fruit large, round; deep yellow; flesh firm, not very juicy; ripens about the end of August.

8. **MOOR PARK**, *Anson's*, *Temple's*, and *Dunmore's Breda*.—This has long been erroneously supposed the Abricot Peche of the French; but that is a large tree, which may be raised from the stone without grafting; it ripens late in August; and the stone is so soft, that a pin will pierce through it, and the kernel is bitter. Introduced by Sir Thomas More, from the Netherlands, about 1700. This is one of the finest of the apricot family; ripens about the end of August; requires a good soil to bring the fruit to perfection; is rather a shy bearer, but one fruit is worth three of some of the other.

9. **ALBERGE**.—The only variety that produces the same fruit as the parent from seed.

10. **PORTUGAL**.—Fruit small; tree pretty good bearer; flavor rather inferior.

11. **PEACH APRICOT**, *Apricot of Nancy*.—Introduced here, in 1767, from Paris, by the Duke of Northumberland, and cultivated in his grace's gardens at Sion House. Is the largest of all the family of apricots, and is often confused with the Moor Park. These two fruits resemble each other, but the leaves and character of the trees are very different; ripens about the end of August.

12. **BRUSSELS**.—Introduced from Brussels, in 1702. Fruit middle-sized, oval; red with dark spots next the sun, greenish yellow in the shade; flesh juicy, not

liable to become mealy; flavor good. Tree hardy, and well calculated for a standard; it is a great bearer, and will grow in worse situations than any of the others. Fruit ripens about the end of August.

13. TRANSPARENT.—Fruit middle-sized; flavor not very good; its beautiful appearance recommends it to our notice.

P L U M S.

PLUM, *Prunus Domestica*, *Linnæus*,—belongs to the class and order *Icosandria Monogynia*, and ranks in the natural order *Rosaceæ*.

Is by botanists considered a native or naturalized to Britain, and is taken up as such in all our native Floras; it is found in hedges and thickets, but its original country is supposed to be Asia, and, according to Pliny, it was brought into Greece from Syria, and thence into Italy. Plums, of all stone-fruits are considered the most wholesome when ripe; and, when unripe, are liable to produce complaints in the bowels.

The varieties of this fruit are now also numerous. Tasser, in 1573, mentions 10 sorts; Parkinson, in 1629, enumerates 60; and Philip Miller only 30 sorts. The French and English Nursery Catalogues name from 70 to 100 sorts; and the Horticultural Society's Catalogue enumerates 298, including stocks.

1. WHITE PRIMORDIAN, or *Jaunehative de Canida*.—Fruit small, round, yellow; flesh mealy, of little flavor; being our earliest plum is almost the only merit it has; ripens in July; is a great bearer.

2. MOROCCO, or *Early Damask*, *Damascus*, *Black Damascus*.—Fruit middle size; red and blue; flesh juicy and pretty well flavored; ripens about the beginning of August.

3. GREAT DAMASK.—Fruit large, oval; blueish; flesh rich; ripens in August.

4. LITTLE BLACK DAMASK.—Fruit smaller than the last; flesh rich; a good bearer; and ripens about the latter end of August.

5. BLUE PERDRIGON, or *Violet*.—Blueish red and yellow; flesh adhering to the stone, rich; good bearer; and ripens in August.

6. FOTHERINGHAM, or *Sheen*.—Fruit middle-sized; dark red; flesh juicy and rich; a good bearer; ripens about the middle of September.

7. ORLEANS, or *Red Damask*.—Fruit large, rather round; red; flesh firm; ripens by the end of August. Is much esteemed for culinary purposes; is seldom sent to table where better sorts are grown. It is a hardy tree, and an exceedingly great bearer, either upon walls or standards.

8. WHITE PERDRIGON, or *Perdrigon Blanc*, *Brignole*.—Fruit middle-sized; pale yellow and red; flesh rich, perfumed; an excellent fruit either raw or in sweetmeats; ripens about the beginning of September.

9. MYROBALAN, (*Prunus Cerasifera*) *Cherry Plum*.—Native of North America. Fruit very small, round; red; flesh sweet. Tree thorny, and blossoms early; ripens about the beginning of September.

10. ORLEANS, WILMOT'S.—Originated by Wilmot, an extensive market-gardener at Isleworth, in 1808; larger than the old Orleans, round; dark purple; flesh rich

and juicy; an esteemed fruit, and great bearer; ripens about the middle of September.

11. ROCHECORBON, or *Red Diaper*, *Diapré Rouge*.—Fruit large, red; flesh very high-flavored; ripens about the beginning of September.

12. GREEN GAGE, *Reine Claude*.—Fruit small, round; yellowish green, when ripened upon a wall exposed to the sun becomes almost of a dark russet, and is the highest flavored plum, and most useful for every domestic purpose that we have. It ripens in September, and is both a hardy tree, and exceedingly good bearer. All the sub-varieties of this plum are good. The name of Green Gage is said to have originated by the family of Gage, in the last century, procuring from the monks of the Chartreuse at Paris, a collection of fruit-trees; when these arrived, the names of all of them was affixed upon them, except the *Reine Claude*, the name of which had been lost in the passage. The gardener, being from this circumstance ignorant of the name, called it, when it bore fruit, the Green Gage, from its green color and the family in whose possession it was.

13. GREEN GAGE, ISLEWORTH.—A seedling of Wilnot's, of that place.

14. LITTLE QUEEN CLAUDIA.—Fruit small; whitish yellow and red; flesh rich; ripens in September.

15. LA ROYALE.—Fruit middle-sized, roundish; light red; whitish within; nearly equal to the green gage; ripens about the end of September; is rather a shy bearer.

16. CHESTON, or *Matchless*.—Fruit middle-sized, oval; dark blue; flesh rich; great bearer; ripens about the end of September.

17. DRAP D'OR, *Cloth of Gold*.—Fruit small, oblong; yellow; flesh very high-flavored; ripens about the end of September; is a great bearer.

18. APRICOT PLUM.—Fruit large; pale yellow and white; flesh sweet; is ripe in October.

19. MAITRE CLAUDE.—Fruit large, round; whitish; flesh sweet; an excellent fruit; ripens about the beginning of October.

20. LA MIRABELLE.—Fruit small; amber coloured; flesh juicy and very sweet; is a great bearer; and is ripe in September or beginning of October.

21. ST. CATHERINE.—Is one of our best plums, either for the dessert or culinary purposes; flesh juicy and sweet; a great bearer; hangs longer upon the tree than any other. It is frequent in gathering for six weeks together; ripens about the end of September.

22. LARGE WHITE DAMASK.—Fruit middle-sized, oval; pale yellow; flesh firm and well-tasted. Tree great bearer; ripens about the beginning of October.

23. PRUNELLE.—Fruit small, long-pointed; white; chiefly used for drying; ripens in October.

24. GOLIATH, *Nectarine*, *Caledonian*.—Fruit very large. Hardy free growing tree. Ripens in October.

25. DAMASCENE, *Black Spanish*, or *Prunes*.—Not often cultivated. Is a useful fruit.

26. DAUPHINE GAGE, or *Great Queen Claudia*.—Fruit small, round; yellowish green; flesh rich and musky; an excellent plum; ripens in September or beginning of October.

27. BLUE IMPERATRICE, or *Violet*.—Fruit small, oval; dark colored; hangs long on the tree; flavor fine; is one of our best late plums; ripens in October.

28. COE'S GOLDEN DROP, *St. Edmund's*, *Bury*, *Coe's*, *Coe's Imperial*, *Golden Drop*, *New Golden Drop*, and *Bury Seedling*.—Fruit large, oval; yellow; flesh firm, juicy, and high-flavored; keeps till the end of December; one of our most valuable late plums; is a good bearer; and ripens about the middle of October.

29. COE'S FINE LATE RED.—Fruit nearly equal to the last.
30. PRECOCE DE TOURS.—Fruit very large, coarse-skinned, and harsh; useful for culinary purposes; a great bearer; ripens in October.
31. RED MAGNUM BONUM, *Red Imperial*.—Fruit large, egg-shaped; red; when well ripened an excellent fruit; at all times useful for culinary purposes.
32. WHITE MAGNUM BONUM, *White Imperial*.—Fruit large; egg-shaped; yellow when well ripened; an excellent fruit; luscious and showy; extremely useful for preserving; ripens in October; great bearer; deserves a wall in most situations.
33. DAPIER BLUE, *Violet Dapier*. }
 34. DAMASK VIOLET. } Both good plums; ripen in October.
35. WENTWORTH, *Monsieurs*.—Fruit large, resembling the white imperial; an excellent plum for culinary purposes, is too sharp to be eaten raw; ripens in October; is a great bearer.
36. WHITE IMPERATRICE.—Resembling the blue imperatrice, except in color.
37. BLUE GAGE.—Inferior to the other gages, but a good plum, and a good bearer.
38. DAMSON, the *Shropshire Damson*, or *Prune Damson* is the best.—It is propagated either by sowing the stones, or by suckers from the roots. Excellent for preserving; ripens about the end of September, and continues in use as long as uninjured by frost.
39. BULLACE, (*Prunus Institia*).—Fruit small, round; green, black, and white; the fruit used for culinary purposes. Tree hardy, and a great bearer; is not fit for the dessert.
40. MUSCLE.—Used for the same purposes as the above.
41. WINE SOUR.—A Yorkshire fruit. Fruit somewhat small, oval; singular flavor, rather agreeable when over-ripe, and shrivelled. It is generally used for preserving; great bearer, and tree hardy.
42. DAMSON, *Common Damson*.—Much used for preserving; great bearer; and lasts upon the tree for some time after it is ripe. Ripens in October.
43. DAMSON, WHITE.—Inferior to the last sort; ripens at the same time.
44. GOLDEN GAGE.—Inferior to the green gage; a good bearer; ripens in September.
45. DOWNTON IMPERATRICE.—Originated by Knight, about 1823, from a seed of the White Magnum Bonum, and the pollen of the Blue Imperatrice; resembles the Blue Imperatrice in shape, but is rather larger, and not so much lengthened at the stalk end. Skin thin; color dull yellow; flesh also yellow, soft, and juicy; stone small and flattish.

C H E R R I E S .

CHERRY, *Prunus Cerasus*, *Linnaeus*,—belongs to the class and order *Icosandria Monogynia*, and are arranged in the natural order *Rosaceæ*.

Is considered by Botanists as a native of Britain, and entered in all our British Floras as such. The cultivated cherry is a native of Asia and Europe, and was brought by the Romans into Italy from Cerasus, a town in Pontus, 73 years before the birth of Christ; and was introduced by them into this country 120 years after-

wards. Some suppose, that those introduced by the Romans were lost in this country, and that they were again introduced by the fruiterer to Henry the Eighth. Lidgate, a poet of the fifteenth century, says, that they were exposed to sale in the streets of London before his time, much in the same way that they are at present. The gum which exudes from the stem and larger branches, when wounded, is considerable, and resembles gum-arabic; it is supposed to be very nutritious. Hasselquist says, that more than a hundred men were preserved from starving, during a long-protracted siege, by letting small pieces of this gum dissolve gradually in their mouths; and that they lived nearly two months upon no other nourishment.

There are many kinds of this fruit cultivated; and the wild varieties are very numerous, as they are yearly propagated from seed. The Romans were acquainted with eight sorts. Tusser, in 1573, mentions red and black. Parkinson, in Charles the First's time, mentions 34 sorts; and Philip Miller 18 sorts. The nursery catalogues of the French and English cultivators include from 50 to 80 names. That of the Horticultural Society enumerates 246 varieties; of these 111 only are considered as cultivated in the British gardens; and of that number, nine are considered varieties of Morello, four black-hearts, four May Dukes, and four white-hearts. The French divide their cherries into three classes: *Bigarreaux*, or hard-fleshed ones; *Griottes*, or tender-fleshed ones; and *Guignes*, geans or small fruits. We in general only make the distinction between cherries and geans: the former including what the French make two classes of.

1. **MAY DUKE.**—Fruit middle-sized, round; red; flesh soft and pleasant; one of our best and most generally cultivated cherries; upon a wall, in favourable situations, it ripens about the beginning of June. It is a great bearer, either upon a wall, espalier, or standard.

2. **EARLY MAY DUKE.**—Is similar to the above, but much smaller, and not by any means so useful a fruit.

3. **ARCH-DUKE.**—Fruit middle size, round, and lighter in color than the last. Is ripe in June.

4. **EARLY BLACK.**—Originated by Knight, in 1816, from the Graffion and May Duke. Resembles the Waterloo. Middle-sized, round, and pointed; black; flesh soft, not juicy. It is said to be earlier than either of the three last, but it is not, according to our experience; indeed, if any difference, under the same circumstances, we would say that it is scarcely so early.

5. **LATE DUKE.**—Can only be considered a variety of the arch-duke, which may from circumstances ripen a few days later.

6. **BLACK TARTARIAN,** *Fraser's Black Tartarian, Black Russian, Circassian, Superb Ditto, Ronald's Black-heart, Ronald's Heart, Fraser's Black-heart.*—Introduced from Russia by M. Fraser, Nurseryman, Sloane-square, in 1796. Fruit large, roundish; black; flesh firm; flavor good. Tree a good bearer; ripens beginning of July.

7. **WHITE TARTARIAN,** *Fraser's White Tartarian, Fraser's White Transparent, Lady Southampton's, Lady Southampton's Duke, Lady Southampton's Yellow.*—Fruit white and transparent; flavor good; excellent bearer; and ripens with the last.

8. **BLACK EAGLE.**—Originated by Knight, from the Graffion and May Duke, in 1814; the seed sown in 1806. Fruit large, rather round; beautiful dark red, covered with a delicate bloom; flesh firm, sweet, and high-flavored. Tree very luxuriant and hardy, an excellent bearer, leaves unusually large. The first produce of fruits from seed is not so fine as they will be after a year or two. A striking instance of this occurred with this cherry when first presented at the table of the Horticultural Society. It was then (being in an imperfect state from want of age) thought by the Fruit Committee to be good for nothing. The fruit now rivals in richness of

flavor as well as beauty, almost any cherry that we possess. A similar circumstance occurred with the Spring Grove peach; the first fruits of which were so harsh and austere, that the original tree was absolutely thrown away, and this would have been lost to us, had not by chance a bud of it been introduced into an old tree before the original showed fruit.

9. **HOLMAN'S DUKE.**—Ripens in July.

10. **BIGARREAU.**

11. **BIGARREAU BLACK.**

12. **BIGARREAU TURKEY.**

} Excellent cherries. Ripen in July.

13. **ELTON.**—Originated by Knight, in 1814, from the White-heart and Graffion. Fruit large, heart-shaped; flesh soft, sweet, juicy, and delicate. Tree very hardy and luxuriant; great bearer.

14. **KENTISH.**—Fruit middle-size; light red; agreeably acid; fit for culinary purposes; not much esteemed for the table. Ripens in July; great bearer on standards, in which way it is generally planted.

15. **HEREFORDSHIRE HEART.**—Fruit middle size; flesh firmer and of finer flavor than hearts in general; ripens about the end of July or beginning of August.

16. **GAICOIGNE'S HEART, or Bleeding Heart.**—Fruit very large, of an oblong form; dark color; flesh firm, and pleasant flavor; ripens the end of July.

17. **HARRISON'S HEART.**—Introduced from the East Indies by Governor Harrison, in 1709, and first cultivated at Balls, in Hertfordshire. Some of the trees were by him presented to George the First, and planted in Kensington fruit garden, and continued above 100 years to produce excellent crops of fruit.

18. **CARNATION.**—Fruit large, round; red and white; flesh soft, not sweet; showy fruit; ripens the end of July.

19. **BLACK HEART.**—Fruit rather large, heart-shaped, and very black and glossy, often staining the hand while gathering it; flesh firm, sweet; much esteemed; rather shy bearer.

20. **WATERLOO.**—Originated by Knight from the May Duke and Ambree, or Graffion. Fruit large, conical; deep red; flesh firm and high-flavored; ripens the end of July. Tree luxuriant, and good bearer. It received its name from the eventful battle which was fought a few weeks previously to its ripening. First exhibited to the Horticultural Society in 1815.

21. **CORONE, Coroun, Caroon.**—Originated from seed of the *Prunus Avium*, or small-fruited cherry; an excellent fruit. Tree hardy, and a good bearer; ripens in August.

22. **WILD RED-FRUITED CHERRY.**

23. **MERRY CHERRY OF CHESHIRE.**

24. **WILD BLACK-FRUITED CHERRY.**

25. **BLACK MAZZARD.**

26. **COMMON BLACK BUCKINGHAMSHIRE.**

27. **WILD LARGE BLACK.**

28. **FLEMISH.**

29. **LUKWARD'S HEART.**

30. **SHAILER'S NEW GRIZZLY.**

31. **YELLOW, or Golden.**

} These are all native English fruits, and may be cultivated in the orchard for variety; not one of them merits a wall.

} These may be cultivated for variety. Their merits are not equal to the first 20 sorts.

32. **FLORENCE.**—Introduced from Florence by John Archer Hublon, Esq. in 1780. Two trees were introduced, one of which was planted in his own garden, at Hallingbury Place, in Essex, and the other at the Priory, in the same county. For the knowledge of this most excellent cherry we are indebted to Walter Calvert, Esq. of Hunsdon, in Hertfordshire, who received a young tree of it from Richard Vachell, Esq.

who found it in the garden of the Priory some years after its introduction. As the original trees are dead, this fruit might have still been unknown to us, had not Mr. Calvert presented grafts of it to the Hort. Society; in which collection it has been deservedly propagated. Fruit middle size, heart-shaped; beautiful pale red; flesh firm, sweet, and rich; much esteemed at Florence; ripens in September. Tree hardy, and a good bearer.

33. WHITE HEART.—Fruit large, heart-shaped; a shy bearer; one of our finest-flavored cherries when ripe; ripens in September.

34. MORELLO, or *Milan*.—Fruit large, round; light red; becomes dark when very ripe, or on a south wall; flesh soft and acid. Ripens in September, and will keep till December. Generally planted on standards and north aspects; when planted on a south wall, or trained over the wall from the north aspect to the south, is much improved in size and flavor. It is the most useful cherry we have for culinary purposes, and is a great bearer.

GEANS

In the Horticultural Society's Catalogues are enumerated 12 varieties of this class of cherries, but there are many more cultivated in Scotland. Some of them, although very small, are extremely high-flavored. Those that are most worth cultivating, are—

35. BLACK HUNGARIAN. } Very fine.
36. WHITE DITTO. }

37. LUNDIE.—First cultivated at a seat of Lord Duncan's, near Dundee, of that name.

38. TRANSPARENT.

39. WHITE SWISS.

40. CASTLE MENZIES. — From a venerable seat of Sir N. Menzies, Bart. in Braedalbane.

41. LARGE BLACK.—Flesh of which is hard, and apt to crack; flavor good.

42. AMBER.

These may be introduced into the park, where their various habits will give variety, and the beautiful red tinge which their decaying leaves assume in autumn, give a color to the landscape highly interesting.

F I G S.

FIG, *Ficus Carica*, *Linnaeus*,—belongs to the class and order *Polygamia Diœcia*, and ranks in the natural order *Urticæ*.

Is a native of Asia; naturalized in the south of Europe, and forms trees as large as our apples. It seldom acquires any magnitude as a standard here, although in the Isle of Wight there are some trees of considerable size. It is with us, as is the case in every part of Europe, a deciduous tree, while in tropical countries it is ever-green. The fig is supposed to have been introduced here by Cardinal Pole, in 1525, and still exists in the garden of the archbishop, in Lambeth. Some of these trees

cover a space of fifty feet in height and forty in breadth. The trunk of one of them is twenty-eight inches in girth, and another is twenty-one. They are of the white Marseilles sort, and bear delicious fruit. In the garden of the Regius Professor of Hebrew, at Oxford, is a fig-tree brought from Aleppo, and planted by Dr. Pocock in 1643; bears a black fruit, and is in a thriving state. Philip Miller introduced about twelve sorts from Italy; before his time this fruit appears to have been little thought of, and scarcely cultivated. It is cultivated here merely for the dessert; but its cultivation becomes a matter of great importance to the inhabitants in fig countries, who not only derive a considerable profit by the exportation of this fruit, in the well-known form that it is met with in our shops, but also as an article of food, which they prepare in a variety of ways, both in a ripe and unripe state. There are few tables in France and Italy which do not produce this fruit in some shape or other, either fried or stewed, or as an addition to their desserts. We are supplied chiefly with our preserved figs from Spain, the south of France, Italy, and the isles and shores of the Mediterranean Sea. Figs should not be planted near meat-safes or larders, as they have the singular property to intenerate the contents sooner than may be desirable. Philips (in Pom. Brit.) relates an experiment made upon a haunch of venison, which had lately been killed, being hung up in a fig-tree when the leaves were on, about ten o'clock in the evening, and was removed before sunrise in the morning, when it was found in a perfect state for cooking. A somewhat similar circumstance occurred to a friend of ours, who had a fig-tree planted against the walls of his house, some of the branches of which were trained near the window of his pantry; during the whole of the summer he could not keep a bit of meat for many hours without its becoming almost putrescent; this occasioned many altercations between him and the butcher, till at length he betook himself to reason the matter, and being a shrewd intelligent person, removed the cause by placing the branches of the fig at a greater distance. After this his meat kept as well as it did before the fig was planted.

This tree is cultivated as a standard in those countries which produce the finest figs; and such as are standards in this country, where the situation is favorable, are much more productive than when upon walls or espaliers in equally favorable situations.

The number of varieties of this fruit are supposed to be great, but possibly far short of the number of names in our nursery and other catalogues. In fig countries they are produced from seeds so readily, that many varieties are yearly springing up. Many have been raised in this country from seeds, particularly by the late Mr. Lee, of the Hammersmith Nursery. It is supposed that there may be, as far as can be ascertained, about 25 distinct varieties worth cultivating. The Horticultural Society enumerates 75 varieties as cultivated in their gardens. It is by forming such collections of names, and by a judicious comparison of the fruits, that we are to arrive at any degree of perfection in the naming or selecting of fruits.

1. **BROWN ISCHIA.**—Fruit globular, with a pretty large eye; large; pinched in near the foot-stalk; color brown or chestnut on the outside, purple within; flesh sweet and high-flavored; containing largish grains. Ripens about the end of July or beginning of August. If planted upon a hot wall, will produce two crops annually. Originally from the island of Ischia.

2. **BLACK GENOA.**—Fruit long, swelling pretty large at the top, where it is obtuse, the lower or part next the foot-stalk very slender; color dark purple, approaching to black, having a delicate bloom over it, like some sorts of grapes and plums, which is easily destroyed by handling; inside color bright red; flesh high-flavoured; ripens early in August.

3. **EARLY WHITE.**—Fruit small, roundish, somewhat flattened at the crown; foot-stalk very short; skin thin; color white; when fully ripe, of a whitish yellow; inside color also white; flesh sweet, but not very high-flavored; ripens about the middle of August. Under favorable circumstances produces two crops annually.

4. **GENOA, Large White.**—Fruit large, globular, somewhat lengthened towards the stalk; skin thin; flesh high-flavored; color yellowish when ripe; inside color red; ripens about the end of August. Will, under favorable circumstances, produce two crops annually.

5. **BLACK ISCHIA.**—Fruit short, middle-sized, somewhat flattened at the crown; color black when ripe; inside color deep red; flesh very high-flavored; ripens in August. An excellent bearer. Originally from the island of Ischia.

6. **MALTA.**—Fruit small, much compressed at the top; much pinched towards the foot-stalk; color pale brown, both outside and in; flesh very sweet and well-flavored; ripens in August; but when left to shrivel upon the tree, becomes very delicious.

7. **MURRAY, or Brown Naples.**—Fruit rather largish, globular; color light brown on the outside, with faint marks of a dirty white; the inside of nearly the same color; flesh well-flavored; ripens about the beginning of September.

8. **BLUE, or Purple.**—Fruit pretty large, oblong; color dark blue or purple. Is a good bearer; ripens in August.

9. **NAPLES, Large Black.**—Fruit long; somewhat compressed at the end; foot-stalks pretty long; leaves more deeply divided than in most other varieties; color dark brown when fully ripe; inside color inclining to red; flesh high-flavored; ripens in September.

10. **ITALIAN, Brown Naples, Brown Turkey.**—Fruit small; color, both outside and in, brown; flesh rich and delicious. Is of slender habits, and well calculated to force when planted in pots or small boxes.

11. **GREEN ISCHIA.**—Fruit oblong, almost globular at the crown; skin thin and delicate; color green, but when ripe the purple flesh shines through the thin skin, and gives it the appearance of being stained with purple; flesh high-flavored; ripens about the beginning of September.

12. **BRUNSWICK, Hanover, Madonna.**—Fruit long, pyramidal; large; outside color brown; flesh light brown, coarse, and of little flavor; ripens about the beginning of September.

13. **LEE'S PERPETUAL.**—Originated by the late Mr. Lee. Is one of the best bearing figs we have, and should be introduced into all fig collections.

14. **GENTILE.**—Fruit middle-sized, globular; color yellow when ripe; flesh of nearly the same color; ripens late, and is a bad bearer.

15. **ISCHIA SMALL BROWN.**—Fruit pyramidal and small, with very short foot-stalks; color brown; flesh inclining to purple; very high-flavored; ripens in September, and is an excellent bearer.

16. **ISCHIA YELLOW, Cyprus.**—Fruit large, pyramidal; color yellow when ripe; flesh purple, and well-flavored; ripens in September, and is but an indifferent bearer.

17. **WHITE MARSEILLES.**—Has been long in this country. Is a good bearer, and high-flavored fig.

VINES.

VINE, *Vitis Vinifera*, Linnæus,—belongs to the class and order *Pentandria Monogynia*, and ranks in the natural order *Viticeæ*.

The vine is supposed to be a native of Persia, and to have migrated from Persia into Egypt, Greece, and Sicily. From the latter country it is thought that it found its way into Italy, Spain, and France; and is supposed to have been there cultivated in the second century. In America they possess their varieties of vines, but they are believed to be varieties of *Vitis Vulpina*, or *Vitis Labrusca*. From the reports that have been received of them, they are not likely to be of much advantage either for the table or the press. It is a native of most of the temperate parts of the world. In very cold regions it will not grow; and within from 25° to 30° of the equinoctial line it seldom succeeds so as to produce good fruit. In the northern hemisphere, the proper vine country, is from 25° to 51° north latitude, or from Schiraz, in Persia, to Coblenz on the Rhine; but some vineyards are to be met with as far north as Dresden, and in Moravia. The juice of the grape was well known to the ancients, and if not to the antediluvian world, it was soon after; for Noah, a short time after the deluge, planted a vineyard, and made wine. Vineyards were abundant, and some of them of great magnitude, in the days of the patriarchs; Solomon had an extensive one at Baalhamon, which he let. The Canaanites, and other nations through which the Israelites passed on their march towards the promised land, had vineyards, as we find mention frequently made of them in the treaties and provisions made by the Israelites for leave to pass through certain countries. Canaan was productive of grapes of an enormous size; as we find Caleb and Joshua bringing a bunch supported upon men's shoulders, to testify of the fruitfulness of the land. It has in all countries, and in the postdiluvian ages, been a favorite fruit of mankind, not only as a delicacy, but as an article of food. In temperate climates, it was eaten with bread, either fresh from the tree, or dried as raisins; and in these countries, from the fermented juice, wine was made, which is supposed to be of all other liquors the most stimulating for the stomach and exhilarating for the spirits of man. The medical properties of the vine are numerous; but whether it has been productive of most good or most harm to man, will for ever remain one of those mysteries which the reasoning of man can never solve. The vine is very rich in its products. The celebrated Hampton Court Hamburg, has been known in one year to produce 2,200 bunches, of nearly a pound each, making in all nearly a ton weight, and is above a hundred years old, and covers a space of above 116 square yards; another at Valentine's, in Essex, covers 147 square yards, and has produced a weight of fruit nearly equal to that at Hampton Court. There is one of the same variety as that first mentioned in our catalogue, in the royal gardens at Cumberland Lodge, of nearly the same dimensions, and produces crops equally abundant. The durability of the timber is great, and instances have occurred of the stem acquiring a size sufficient to admit of planks being cut out of them fifteen inches broad; and one lately dead in Yorkshire, measured four feet in circumference. The branches also grow both rapidly, and extend to a great distance from the stem. In the hedges in Italy, and other wine countries, they overtop the highest growing trees. The fruit, under good management, acquires a great size and weight; bunches of the Syrian, one of our largest grapes, have been grown in this country, weighing nearly twenty pounds; and the same variety in Syria has

been known to exceed forty pounds weight. It is supposed to equal, if not to exceed, the oak in longevity; four and six hundred years being given by Pliny and Bosc, as its ordinary age. The Burgundy vineyards are many of them four hundred years old; and many of those in Italy are still flourishing, which are known to be above three hundred. Vine-growers reckon the vine young at one hundred years; and many of those in England, still in prosperity, are equally old.

At what period the vine was introduced into Britain is not exactly known. It is, however, generally admitted to have been brought from Italy by the Romans; and if not so early as the days of the Romans, it was afterwards introduced by the religious hordes who visited this country, either for the purpose of the conversion of its inhabitants, or more probably in search of an asylum from the persecutions of some of the Roman emperors. Tacitus, in A. D. 79, considered the soil and climate of this country unfit for the vine. However, in the third century, under the Emperor Probus, we find, not only the vine cultivated, but also wine made. It is very probable that the Roman generals cultivated this fruit, the want of which they would naturally feel; and as they introduced the cherry, and built and ornamented villas after the fashion of their own country, it is very probable that they also introduced the vine. The venerable Bede, in 731, expressly says, that there were vineyards in many places; and as the clergy from his time till the reformation assiduously cultivated fruits round their monasteries, there is every probability that they also cultivated the vine, with the use of which they were so well acquainted before their retreat and during their visits to Italy. Vines may have been neglected and ultimately lost here after the dissolution of religious houses; and as we held several French provinces in subjection in the time of the Henries, from whence wine may have been procured sufficient for the then small consumption, the cultivation of it might have been abandoned.

It does not appear that the making of wine in this country would be of any national importance, otherwise we might have our vineyards and wine presses as well as our orchards and cider mills. It is sufficiently proved, by repeated successful experiments, that we could produce wines in the southern parts of England as good as many of those imported. Individuals, in favorable situations, may find much real satisfaction in forming vineyards and drinking their own produce. The Duke of Norfolk had a vineyard at Arundel Castle, from which was made excellent burgundy; and Warner, with whom Warner's Black Hamburg originated, made also good wine from his vineyard at Rotherhithe. An excellent champagne was made by the Hon. C. Hamilton, at Painshill. At present, Mr. J. Kirk, of the Brompton Nursery, has a wall of 220 yards long covered with white muscadine grapes, which for many years has borne immense crops. In front of this wall are cultivated vines of the same grape upon standards, or rather trained to poles about four feet high, which, although the fruit does not always ripen, yet they bear great crops, and would produce very good wine.

The varieties of grape-vines are extremely numerous; many of them, it must be confessed, are the effect of soil and cultivation; and many kinds are kept in the British nursery gardens for supplying the British foreign possessions with wine varieties, rather than for any purpose to which they may be supposed to be applicable in this country. Tusser, in 1560, only speaks of white and red grapes. Parkinson, in 1627, enumerates 23 sorts. Ray, in 1688, says that 12 sorts were in request. Rea, in 1702, enumerates 17 sorts. In the catalogue of the Luxemburg collection, are enumerated 267 sorts. And the librarian to the botanic garden of Madrid, has described 120 sorts. The lists of both the Paris and London nurseries are very numerous; and the Horticultural Society's Catalogue enumerates 159 varieties of *Vitis Vinifera*; three varieties of *Vitis Volpina*, and five of *Vitis Labrusca*; from

the two last species are supposed to have originated all the American vines indigenous to that country.

1. HAMBURG, BLACK (TRUE).—Bunches large; berries large, oblong; color black; pleasant and vinous flavor; a great bearer, and one of the best grapes we have; on which account we have given the figure of it, preferring it to all others, as being the most universally cultivated.

2. HAMBURG, WARNER'S BLACK, *Black Hamburg, Warner's, Red Hamburg, Gibraltar, Hampton Court Vine*.—Originated before 1730, by Warner, a gentleman of Rotherhithe. Bunches large; berry large, and thin-skinned; reddish* or dirty rose color; is a great bearer, and reckoned the best of the Hamburgs.

3. HAMBURG PURPLE.—Resembles the Black Hamburg, except in color. Bunches large; berries large; color dark purple; flavor good; and a good bearer.

4. HAMBURG, WHITE, *Lisbon, Portugal*.—Bunches middling-sized; berries large; color white; rather an indifferent bearer.

5. HAMBURG, BROWN.—Resembling the black Hamburg, except in color.

6. ALEPPO, *Striped Aleppo, Variegated Grapes*.—Bunches middle-sized; berries middle-sized; frequently striped black and white; flesh juicy; fine flavor.

7. ALICANT, *Black Spanish*.—Fruit black; flavor good.

8. BLACK CLUSTER, *Burgundy, Auvernat, Black Burgundy*.—Originally from Burgundy. Bunches small, berries small, sitting close together; black and oval; flavor pleasant; leaves hoary; a great bearer, and good wall-fruit; seldom introduced into grape-houses.

9. BLACK JULY, EARLY, *Raisin Precoc, Madeleine, Maurillon, Madeleine Noire*.—An old variety, originally from France. Bunches small; berries small, globular; black; flavor sugary; most esteemed for being early ripe; seldom planted in grape-houses; ripens upon the open walls.

10. BLACK PRINCE.—Bunches large; berries very large, globular; dark brown, or black; one of our best grapes, and should hold a place in every vinery.

11. BLACK RAISIN.—Originated from Languedoc. Bunches middle-sized; berries large, thick-skinned, oblong, and black; not much esteemed.

12. BURGUNDY, MILLER'S, *Le Meunier, Miller's, Miller's Cluster, The Miller Grape*.—Originated from seed by Philip Miller, about 1720. Bunches middle size; berries middle size, oblong, and black; flavor rough; great bearer, and very hardy; excellent wine grape; cultivated as such in 1750, in the vineyard at Painshill.

13. BLACK CLUSTER, LARGE.—Sent from Portugal in 1740, to Speechly. Bunches middle-sized; berries middle-sized, oblong, and black; flavor rough and harsh; excellent for wine.

14. CHASSELAS, *Chasselas de Fontainebleau, Chasselas Doré, Royal Muscadine*.—Supposed to have been introduced in 1660, by Sir William Temple. Bunches large; berries middle-sized; color white; and round shaped; flavor rich; an excellent bearer, and deserves a place in every vinery, particularly for late crops.

15. BLACK FRANKENDALE, *Black Muscadine, Frankenthal*.—An old and approved variety. Bunches middle-sized; berries middle-sized, round, and black; flavor rich and juicy; is well calculated for the open walls, and is a great bearer. This is the Black Hamburg of the continental gardens.

16. BLACK DAMASCUS, *Workshop Manor Grape*.—Bunches largish; berries large, round, and black. An excellent high-flavored grape, well calculated for late crops.

* Soil and cultivation may probably affect the color; if so, the two first grapes are the same as it is only in that character that they differ.

17. **ESPERIONE**, *Hardy Blue*, *Windsor*, *Turner's Black*.—Bunches middle size; berries middle-sized, round, and black; great bearer, and very hardy; brought into notice by John Aiton, Esq., of Windsor.

18. **CLARET**, *Blood Red*.—Bunches rather small; berries small, round, and dark red, approaching to black; flavor harsh, and claret tasted; great bearer, and hardy; juice red. The leaves are used to color wines made from white fruit, such as white grapes, gooseberries, &c., and the leaves have been found to make a tolerable wine, of a red color.

19. **AMIENS**, *Leon*.—Very hardy grape, well suited for the open walls.

20. **LOMBARDY**, *Flame colored Tokay*, *Brick Grape*.—Bunches large; berries largish; brick colored; flavor good.

21. **FRONTIGNAC**, *White*, *Muscat Blanc*.—Bunches middle-sized; berries large, round, and white, when well ripened approaching amber colored; flavor good. One of our most esteemed grapes for hot-houses or vineries.

22. **FRONTIGNAC**, *Red*, *Muscat Rouge*.—Bunches middle-sized; berries large, oval, and brick colored; a much esteemed grape.

23. **FRONTIGNAC GRIZZLY**, *Muscat Gris*.—Bunches small; berries middle sized, round; brownish, red, and yellow; rather shy bearer; flavor exquisite; keeps long on the tree, and often becomes shrivelled when over ripe.

24. **FRONTIGNAC**, *Blue*.—Like all the Frontignacs, of great merits, they are all rather delicate, and should, therefore, be planted in a house by themselves, and never amongst strong growing sorts, like the Hamburgs or Muscat of Alexandria, as they are apt to rob them of their due share of nourishment.

25. **FRONTIGNAC** *Black*, *Muscat Noir*.—Bunches rather small; berries middle-sized, round, and black; flavor rich and vinous; well calculated for the open walls, and equally deserving a place in the vinery.

26. **CORINTH**, *Black*, *Zant*, *Black Ascalon*, *Currant*.—This is the currant of the shops. Originally from Ascalon in Palestine, and was early introduced into this country. Bunches small; berries small, round, and black; being generally without stones. The white Corinth is similar, except in color. Seldom cultivated.

27. **AMBER MUSCADINE**, *common White Muscadine*.—Introduced by Sir William Temple in 1660. Bunches middle size; berries middle size, round, and white; a great bearer, and well calculated for the open wall.

28. **SYRIAN**.—Bunches very large; berries very large, long, and white. The largest of all our grapes, has been grown nearly twenty pounds weight; coarse fruit, with hard flesh, and thick skin; is a good bearer; not much in cultivation.

29. **RAISIN**, *White*.—Bunches large and straggling; berries large, long, and white; good bearer; hangs long on the trees, and when fully ripe of a good flavor.

30. **ST. PETER'S**, *West's*.—Bunches large; berries middle size, round, and dark brown or black; a good bearer, and excellent grape for late crops, keeps long on the vine. Fruit ripe in October, will keep till March.

31. **ST. PETER'S** *Black*.—Bunches large; berries large, round, and black; juicy, and high-flavored; similar to the above.

32. **WHITE SWEET-WATER**, *NEW DUTCH*.—Bunches largish; berries large, round, and white; one of our best white grapes.

33. **WHITE SWEET-WATER**, *OLD*.—Fruit less in all its parts than the above; and although a good grape, much inferior to the last.

34. **WHITE SWEET-WATER**, *GROVE END*.—So called, having been first observed by W. Atkinson, Esq., in his garden at Grove End, its real name being unknown. The fruit ripens on the wall more than a fortnight before any other grape. The bunches are rather smaller than the Royal Muscadine, and shoulder more than the

Sweet-water. The berries are somewhat of an oval shape; of a transparent green, when forced in the house; and the seeds distinctly seen through the pulp. They take a brownish tinge, when grown upon the open walls, particularly towards the sun. The skin is extremely thin and delicate; pulp tender, sweet, and rich. Its earliness and beauty recommend it to general cultivation; and for a wall-grape, either to ripen, or make wine, few excel it.

35. MUSCAT OF JERUSALEM, NEW.—Originated by Miller, in 1738. Bunches large; berries very large; flavor excellent.

36. MUSCAT OF ALEXANDRIA, *White Muscat of Jerusalem, Alexandrian Frontignac, Malaga, Passe-Musquée*.—Bunches large; berries large; well adapted for the hot-house; flavor excellent.

37. MUSCAT OF LUNEL, *White Lunel*.—Bunches middling large; berries large; an excellent grape; high-flavored; and a great bearer.

38. BLACK MUSCADINE.—An old variety, originally from France. Bunches middling size; berries large, long, and black; flavor good; and a good bearer.

39. BLACK LISBON.—Introduced from Portugal about 1780. Bunches large; berries large; flavor good; and an excellent bearer.

40. SCOTCH WHITE CLUSTER.—Originated by a blacksmith at Edinburgh, in 1812. Bunch middle-sized; berries small, round, and white; very hardy, and a great bearer; well adapted for the open walls.

41. RED CHASSELAS, *Red Muscadine*.—Bunches large; berries small and round; an excellent grape.

42. VERDELHO.—Bunches small; berries small, oval, and whitish yellow; flavor pretty good; plant very hardy, and well adapted for the open wall. The well-known Madeira wine is understood to be produced in that island from a variety of sorts of vines; but the Verdelho is said to abound the most in those vineyards that are most famed for the production of the best wine. It is apt to produce a quantity of small seedless berries intermixed with the others, and therefore appears to be defective in the parts of fructification, and accounts for its not setting freely. The fruit is peculiarly acid till it is fully ripe, and then the flavor is rich and saccharine. Introduced by John Williams, Esq., of Pitmaston, about 1807.

43. MALVOISIE, *Blue Tokay*.—Berries small, powdered with a blueish bloom; flavor vinous.

44. MUSCAT OF ALEXANDRIA, RED.—Bunches large; berries large, oblong, reddish; flavor rich, musky, and vinous. Like all the other Muscats, requires a hot-house to bring it to perfection.

45. THE KISHMISH GRAPE.—Introduced by Mr. Oldaker from St. Petersburg, in 1812, and cultivated at Spring Grove. Is said to be a native of the island of Kishm, or Kishmish, in the Persian Gulph. A very diminutive grape, the bunches seldom exceeding five inches in length, the berries little larger than white currants; of a greenish tint, but becoming ultimately of an amber hue. Their flavor is indifferent, and the berries free of seeds. It is curious and extremely pretty, and has a good effect when cultivated in pots, and carried to the table loaded with its strange-looking fruit.

46. VARIEGATED CHASSELAS.—Originated by T. A. Knight, Esq. prior to 1812. This variety sprang from a seed of the White Chasselas and the pollen of the Aleppo Grape, which readily variegates the leaves and fruit of the offspring of any white grape. Bunches middle-size; berry small, sometimes striped with green; natural color black; leaves green during summer, but become towards autumn beautifully variegated with red and yellow, particularly if planted in a light soil, or in pots. Plant very hardy, adapted for the open walls, and is a great bearer; flavor inferior,

but well adapted for making wine. Fruit keeps long after it is separated from the tree, by being hung up in a dry room.

47. WANTAGE GRAPE.—The original plant was discovered by Mr. J. Wilmot growing against the wall of a house at Wantage, in Berkshire, where it had been raised from the seed of a dried raisin some years ago. It is a hardy grape, and well calculated for the open walls. The bunches are large; berries nearly round; color approaching that of the Grizzly Frontignac; of an excellent flavor, and a great bearer.

48. THE ALEXANDRIAN CIOUTAT GRAPE.—Originated by J. Williams, Esq. prior to 1820, from seeds of the Parsley Grape and pollen of the White Muscat of Alexandria. The fruit has all the fleshy firmness of the Muscat of Alexandria, but has none of the perfume. The plant is a great bearer, and grows with great vigour. The berries, however, set thin on the bunch, but it possesses the good property of keeping without withering or rotting on the bunch much longer than any other grape. It has been known to have kept for three months after disengaged from the plant; namely, from January till April.

For the description of the last four sorts we are indebted to the Transactions of the Horticultural Society.

MELONS.

MELON, *Cucumis Melo*, *Linnaeus*,—belongs to the class and order *Monœcia Monodelphia*, and ranks in the natural order *Cucurbitaceæ*. The native country of the melon is not known. It has been cultivated in this country since 1570, and brought here from Jamaica. The varieties of melons are very numerous; every gardener has his favorite sorts, suitable for the purposes for which he grows them; some prefer large showy melons, and others prefer small high-flavored ones. Small melons are almost always best flavored, and for the most part the greatest bearers. The English melons most in cultivation are—

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| 1. BRAZILIAN. | 16. GREEN-FLESHED, EGYPTIAN. |
| 2. BUCHARIAN. | 17. DO. ITALIAN. |
| 3. EARLY CANTALOUPE. | 18. BITTED SUCCADA. |
| 4. EARLY ROCK. | 19. VALENTIA, or <i>Winter</i> . |
| 5. EARLY POLIGNAC. | 20. NUTMEG. |
| 6. BLACK ROCK, LARGE. | 21. HARDY RIDGE. |
| 7. DO. SMALL. | 22. HARDY SCARLET FLESHED. |
| 8. DO. LORD VERNON'S. | 23. LEVANT. |
| 9. MONTAGUE CANTALOUPE. | 24. GOLDEN ROCK. |
| 10. NETTED CANTALOUPE. | 25. SCARLET ROCK. |
| 11. ORANGE CANTALOUPE. | 26. SILVER ROCK. |
| 12. CITRON. | 27. ROMANA. |
| 13. SCARLET-FLESHED, NETTED. | 28. SCARLET-FLESHED, SMOOTH. |
| 14. PINE-APPLE. | 29. GREEN-FLESHED IONIAN CANTALOUPE. |
| 15. GREEN-FLESHED. | |

The WINTER, or *Valentia*, is much cultivated in countries bordering on the Mediterranean Sea, particularly in the orange gardens in Toulon, from whence the Paris market is supplied. It has been lately introduced here by the Horticultural Society, but is not likely to be much cultivated.

The MONTAGUE CANTALOUPE.—The Montague Cantaloupe originated by Mr. D. Anderson, gardener to Lord Montague, at Ditton Park, in 1815. Pine-apple, Green-fleshed, Scarlet Rock, and Scarlet-fleshed, are the highest flavored; but of these, as well as the others, many very indifferent sub-varieties are in cultivation, in consequence of sufficient care not being paid to keep them from being impregnated while in flower by others of more indifferent properties. It is a difficult matter to procure good seed in the first instance, and difficult to continue it good, particularly where many sorts are grown in the same garden. Two or three good varieties are as much as should be cultivated where the flavor of melons is an object; and, when once procured, should be carefully preserved. The French melons are not superior to those described above; but the Persian melons have long been celebrated for their excellence. Few, however, of them had found their way into Europe, until within these few years, and that has been accomplished by the exertions of the Horticultural Society. These melons differ remarkably from those commonly cultivated in Europe. They are altogether destitute of the thick hard rind, which renders one-half of some of our finest melons useless, and are protected only by a skin so thin and delicate, that they are subject to injury from causes, which would produce no perceptible effect upon the melons of Europe. Their flesh is extremely tender, rich, and sweet, and flows copiously with a cool juice which renders them still more grateful. They are also abundant bearers, and their fruit is extremely beautiful. They are, however found difficult to cultivate, as they require a very high temperature, a dry atmosphere, and a very humid soil. They, however, will not endure any undue supply of water over their leaves, for if too freely given, it will bring on spotting and canker; and in such cases, the plants often perish before they perfect their fruit. The Persian gardeners cultivate them in the open fields, which they take care to have intersected in every direction with small streams, between which beds are raised, richly manured with pigeons' dung, upon which the melons are planted. The climate being favorable, the Persian cultivator has only to guard against any scarcity of water, and a trifling regulation of the vines as they proceed in growth. With us the case is different; the ventilation, heat, and water of our hot-beds, or other artificial agents, are operating in opposition to each other. Those who have succeeded most in the cultivation of these fruits here, have supplied their roots abundantly with water, without giving them any over head; and by keeping up a high temperature, by strong linings, have been enabled to admit a considerable degree of ventilation. Care must be taken to guard against damp, and when that appears, should, if possible, be removed; and if the vines be injured by it, apply hot lime in powder to the part affected. The fruit, when set, should be placed upon tiles or bricks, as is often practised with our best European melons. Probably training them upon a trellice would admit of copious watering at the roots, without injuring the leaves and shoots with damp.

30. THE DAMPSHA, or *Zamsky*.—A rather curious fruit, of a nearly cylindrical form; said to be of excellent flavor, and will keep for some months hung up by the stalk, or in nets in a dark room.

31. THE ISPAHAN, or *Sweet Melon*.—Is also recommended as a good fruit.

32. KEISING MELON.—A beautiful egg-shaped fruit, about eight inches long by five wide in the middle; color pale yellow, beautifully netted all over; flesh nearly white, from an inch and a half to two and a quarter in thickness; high-flavored, and resembling in texture a well-ripened Beurré pear; rind firm, but so

thin that all the fleshy part of the fruit may be eaten. It derives its name from the village of Keiseng, near Ispahan.

33. **GEREE MELON.**—Shape oval, and in size measures eight inches in length by four and a half in breadth; sometimes netted, sometimes quite smooth; skin mottled with dark sea-green upon a pale ground; flesh an inch and a half to two inches thick; bright green; melting; very sweet, and high-flavored. Inferior in flavor to no other melon, except the Keiseng, above noticed. Is a good bearer. The seed of this melon has been disseminated under the name of the *Ostrich Egg Melon*.

34. **DAREE MELON.**—Resembling the last in many particulars. Is a much more abundant bearer, as well as a larger fruit. Is considered a finer fruit than the *Geree*, but less highly flavored.

35. **SEEN MELON.**—Handsome fruit, seven inches long by five wide; shape *ovate*; surface pale dusky yellow; regularly and closely netted all over, except a small *mamelon* at the apex, which is but little marked; flesh one and a half to two inches thick; pale green, sometimes becoming reddish towards the inside; very tender and juicy. A good bearer, but late in ripening. Derives its name from Seen, a village near *Ispahan*, from whence it was procured.

36. **LARGE GERMEK MELON.**—Fruit large and handsome, weighing from five to six pounds; shaped like a depressed sphere; usually six inches deep, but varying from seven to nine inches in breadth; surface sea-green, so closely netted that it presents the appearance of *shagreen* leather; rind thin; flesh from one to two inches thick, green, becoming paler towards the inside; firm, juicy, rich, and high-flavored; ripens early both in this country and Persia. It is very prolific, and the fruit is the largest Persian melon we have in this country.

37. **SMALL GERMEK MELON.**—Ripens about a week before the last, which it resembles in figure, but is by no means so fine a fruit, and is an indifferent bearer. The vines being tender, are apt to die before the fruit is ripe.

38. **THE GREEN HOOSAINEE MELON.**—A handsome egg-shaped fruit, five inches long by four broad; when ripe, of a fine, even, light green color; regularly netted surface; the side most exposed becomes of a rather yellowish color; flesh pale greenish white, tender, and delicate; full of a pleasant sweet juice. Is a great bearer, and as hardy as any of them, except the *Germek*.

39. **THE STRIPED HOOSAINEE MELON.**—Very handsome fruit; and is an excellent bearer; of an *ovate* figure, measuring from five to six inches in length by four or five inches in breadth at the widest part; flesh white, crisp, juicy, and sweetish, but not high-flavored.

40. **THE KURCHAING MELON.**—A very handsome oval fruit, ten inches long by five broad; skin lemon-colored; flesh white, not very juicy, extremely delicate, but not high flavored. Is rather an indifferent bearer; and derives its name from a small village near *Ispahan*.

41. **THE MELON OF GOORGAB.**—An oblong fruit, about seven and a half inches long by four and a half broad; of inferior qualities to any of those already noticed.

42. **THE QUEEN'S POCKET MELON, *Early Queen, Queen Ann's Melon.***—Is a variety of *Cucumis Dudaine*, and is to be considered more a subject of ornament than utility. It is the smallest of all the cultivated melon tribe, and is of very indifferent flavor; resembling more the fruit of a *Passiflora* than a melon.

The description of the Persian Melons in the above list is from the Transactions of the Horticultural Society.

CUCUMBERS.

CUCUMBER, *Cucumis Sativus*, *Linnaeus*,—belongs to the class and order *Monœcia Monodelphia*, and ranks in the natural order *Cucurbitaceæ*.

Is a native of the East Indies. It abounds in many parts of the tropical world. In Egypt it is abundant, and has been so from the earliest ages; it is among the few fruits mentioned by the Jewish historian. It formed not only an article of luxury to the inhabitants of Egypt, but an article of general food, and is by them held in high esteem unto this day. The Emperor Tiberius, we are informed by Martial, in his Epigrams, and also by Pliny, was so fond of cucumbers, that he had them in his garden all the year through, by means of specularia, where they were grown in boxes, wheeled out in fine weather, and replaced in the nights, or in cold weather. It was introduced here in 1573, and is now cultivated to an astonishing extent. Those who have not seen the wagon-loads of them in Covent Garden Market, cannot but be surprised to hear of whole fields being annually covered with cucumbers, some of which have been known to furnish the London market with ten thousand bushels of pickling cucumbers in one week. In Germany and Poland barrels of cucumbers are salted and preserved in vinegar from one year to another.

The names of varieties of cucumbers are so arbitrary, that it would be of little use to attempt any thing like a description of them. Every gardener has what he calls his own, of which he is careful to keep from being impregnated with the fertilizing pollen of inferior sorts. The following are esteemed good varieties :—

1. **FLANAGAN'S**.—Of nearly two feet in length, and of superior flavor and crispness; and is an excellent bearer.

2. **SPARREY'S**.—An excellent forcing sort, originated with Mr. Adam Sparrey, late gardener to Lord Rodney. Is an excellent early forcing one, and a good bearer for general crops.

3. **EARLY LONG PRICKLY**.—From five to seven inches long; an excellent sort, both as a general bearer and crisp eating fruit.

4. **EARLY SHORT PRICKLY**.—From four to five inches long; excellent for early forcing, and as good for ridging out for picklers.

5. **CHESTER CUCUMBER**.—The vines of this variety are disposed to climb by means of its tendrils; the leaves are smaller than any other known variety; as it occupies little room, and is a good bearer, it is calculated for early forcing in large pots or boxes; fruit from four to five inches long.

6. **WHITE TURKEY**.—Is not a great bearer, but is sometimes cultivated for some culinary purposes, for which it is thought better adapted than any of the green sorts.

7. **FLUTED CUCUMBER**.—A Chinese variety, recommended in the Horticultural Transactions.

8. **NEPAL CUCUMBER**.—Sent by Dr. Wallick from Calcutta to the Horticultural Society. Is of large growth, measuring seventeen inches in length, and twenty-four in girth, and weighing usually above twelve pounds. It is sometimes cultivated for stewing, but is not likely to become of general culture.

9. **KELLY'S CUCUMBER**.—An esteemed Scotch variety, well suited for forcing in pots; is a hardy free setting sort, and handsome fruit; from six to twelve inches in length.

10. **SOUTHGATE.**—A well known cucumber round London; fruit long; fine green color; eats crisp; and is a good bearer.

11. **MOIR'S CUCUMBER.**—Long successfully cultivated by the late Moir, of the King's Road. An excellent bearer, and esteemed fruit.

PINES.

PINE APPLE, *Bromelia Ananas, Linnæus,*—belongs to the class and order *Hexandria Monogynia*, and natural order *Bromelia*. Is considered a native of South America, although it is found indigenous in several parts of Africa in great abundance. Gonçalo Hernandez de Oviedo is the first person to whom we are indebted for any account of the Pine. He was born in 1478, at Madrid; and in 1513, departed for America, where he was appointed governor of St. Domingo. In that year he printed his "Universal History of India," which was printed at Seville, and in which he makes mention of three kinds of pine-apples which were known in America under the names of *Yayama*, *Boniama*, and *Yayagua*, but which were designated by the Spaniards under the general appellation of *Pinas*. At this period, frequent attempts were made to send the fruit in an unripe state to Spain, but they always became rotten during the voyage; afterwards it was attempted to transport the tops or crowns to Spain, but these also were destroyed during the passage.

In the year 1541, Gerommo Benzono, an Italian, repaired to Mexico, where he resided until 1555, and on his return he wrote the History of the New World, which was printed in Venice in 1568. In this work he passes a high eulogium on the pine, and declares it to be the "finest fruit on this good earth of God."

Andre Thevet, a Franciscan Monk, who resided in Brazil in 1555-56, has transmitted us a description of the *Ananas* under the name of *Nanas*. At that time the art of preserving them in sugar was well known.

In 1557, Jean de Lery, who went out as a priest to a colony of Huguenots in Brazil, makes frequent mention of the *Ananas*, and in the inflated style of those early times, he describes that to be the fruit on which the gods luxuriate, and which ought only to be cut by the hand of a Venus.

In the 16th century, Franc. Hernandez, who undertook a most expensive journey to Mexico at the charge of Philip II., at the same time that Acosta was in America, has furnished us with some good drawings of the *Ananas*, to which, however, he gives the name of *Matzatti*, or *Pinca Indica*.

Linnæus gives New Spain and Surinam as the native habitat of the pine; and Acosta says, that it was first sent from Santa Cruz, in Brazil, into the West, and afterwards into the East Indies. It was introduced into Europe from the West Indies by Le Cour, of Leyden, about the middle of the seventeenth century. From Leyden it came into England, and is said to have been first cultivated here by Sir M. Decker, of Richmond; and next, by John Blackburn, Esq., in Lancashire. According to the *Hortus Kewensis*, it was introduced here as a botanical plant as early as 1690 by Bentick. It was introduced into Scotland before 1732, as Justice gives a plan of a stove erected by himself, in which the pine fruited for the first time in that country, in his garden, near Edinburgh. It is now so generally cultivated, that few

gardens are considered as complete without several departments for the cultivation of this "*king of fruits*."

In the West India Islands there are many varieties of this fruit, as might be expected where it grows spontaneously from seed. In this country many varieties have originated from seeds, some so early as the days of Miller. Speechly raised above seventy varieties in 1768, from seeds sent from the West Indies. It has been observed as a rather singular circumstance, that those fruits have produced seeds most freely that were in blossom in August, and ripened in December.

Like most other fruits of admired quality, there are many varieties in cultivation.

In the pine stoves of Mr. Gunter, of Earl's Court, Kensington, there are cultivated above thirty sorts. The nursery catalogues seldom enumerate the number of varieties of this fruit. The catalogue of the Horticultural Society enumerates 95 sorts, which is by far the most lengthened list of names ever published. The following list includes all that are in general cultivation at this time.

1. The **QUEEN**, or *Old Queen*, to distinguish it from the next.—Fruit oval; color golden; size middling, rather large; generally under good management, attains the weight of from three to four pounds, sometimes more. Is the hardiest pine we have, and comes to its greatest perfection in much less time, and with much less trouble than any other; has been brought to perfection in the short period of fifteen or eighteen months. It is more certain of showing fruit while young, and at a proper season, than any other.

2. **RIPLEY'S NEW QUEEN**.—Is considered as a sub-variety of the last; is a more elegant fruit, and also fruits in an equally short time. It is more generally cultivated now than any other. We have chosen this pine for our figure, as it is the most useful sort for general purposes in cultivation; fruiting in the short space of fifteen or eighteen months, and possessing the merits of a handsome form, good size, and high flavor, and capable, with the last mentioned, of being cultivated in perfection upon beds of fermented dung or leaves in frames, with as little difficulty, and little extra expence, to that required to grow early cucumbers.

3. **GLOBE**, *Russian Globe*.—Another sub-variety of the Queen. It has been ascertained, that this sort was sent by Messrs. Loddige, of the Hackney Nurseries, to Russia, above thirty years ago, and has been lately re-introduced from that country, by the latter name.

4. **SILVER-STRIPED QUEEN**.—Plant elegant in appearance, being striped in the leaves with white, yellow, and red; is rather a shy bearer; and, therefore, not often cultivated. This is not the only variegated or striped leaved pine met with in collections; there are several others, but their merits are not sufficient to recommend them to general cultivation.

5. **KING PINE**, or *Shining Green*.—The leaves are of a grass green; color glossy; the pulp hard and stringy; the flavor good when fully ripe; not generally cultivated.

6. **PRICKLY STRIPED SUGAR-LOAF**.—Fruit cone-shaped, or pyramidal; color golden when ripe; leaves striped with black, or dark purple lines.

7. **BROWN SUGAR-LOAF**, or *Pyramidal*.—Fruit cone-shaped (thence the name); color dark, till it ripens, when it becomes yellow; flesh very yellow; leaves brownish.

8. **SMOOTH STRIPED SUGAR-LOAF**.—Similar to the prickly striped sugar-loaf, but without prickles on the leaves.

9. **WELBECK SEEDLING**.—Fruit small, generally broader at the head, than at the base; color pale, or sulphur; pips very flat; flesh white and tender; flavor rich, with less acidity than is found in most other pines.

10. **HAVANNAH**.—Color dark till it ripens; tankard shaped.

11. **ST. VINCENT'S PINE**, or *Green*.—Fruit middle sized, and pyramidal; when ripe, of an olive hue. This is rather a rare variety, not often met with in cultivation.

12. MONTSERRAT.—Fruit middle sized, and tun-shaped; pips larger and flatter than in other pines; leaves of a dark brown, inclining to purple in the inside.

13. BLACK JAMAICA.—Fruit large; and the leaves and habit of the plants resembling the following one.

14. BLACK ANTIGUA.—Fruit shaped like the frustum of a pyramid; pips large, often an inch in diameter; size large, attaining the weight of from three to four pounds; color dark till it ripens; very juicy, and high flavored; leaves of a brownish tinge, and drooping at their extremities, with strong prickles thinly scattered upon the edges of the leaves.

15. PROVIDENCE, or *New Providence*.—Of this there are two varieties, the white and green. Fruit much larger than any that are cultivated in this country; shape pyramidal; color at first brownish, but when ripe of a pale yellow; flesh yellow and juicy. This is a valuable fruit, but requires generally three years, and often four, to bring it to maturity.

16. OLD PROVIDENCE.—A very different and inferior fruit, originally from one of the Bermuda islands of that name; not generally cultivated.

17. ENVELL.—An excellent pine; attains a large size; and is of good flavor.

18. BLOOD RED.—Fruit equal in bulk at both ends; pips of moderate size; color brick red; flesh white and opaque; flavor inferior to most others, and is cultivated more for curiosity than any real merit; leaves of a changeable hue; appearance rather sickly than otherwise.

STRAWBERRIES.

STRAWBERRY, *Fragaria*, Linnæus,—belongs to the class and order *Icosandria Polygynia*, and ranks in the natural order *Rosaceæ*.

Botanists have disagreed, whether the several sorts of cultivated strawberries, are really distinct species of the genus *Fragaria*, or only varieties of one or two species. The *Grandiflora*, or pine; the *Virginiana*, or common scarlet; and the *Chiloensis*, or *Chili*, are supposed by Knight, to be varieties of one species only, as they may be all made to breed together indiscriminately. They are natives of the greater part of Europe, particularly the North, and are found in the temperate regions of America. The fruit is held in high estimation, and is recommended to people of gouty, and rheumatic habits. Patients afflicted with stone, have found much relief from eating them largely; and it is supposed by some, that the name *Fragaria*, is derived from (*Frangans*), to break, as they are of efficacy in dissolving or breaking the stone; others derive the name from the fragrance of the fruit; and the English name of strawberry, from the practice of laying straw between the rows, to keep the fruit clean. Their juice dissolves the tartar of the teeth, and promotes perspiration.

They have been long cultivated in this country. The wood-strawberry must have attracted the attention of our ancestors at an early period. Their varieties till of late years, were not numerous. They appear to have attracted the notice of the Horticultural Society, soon after its formation, and to some of the members of that society, we owe not only many of our finest sorts, but also the cultivation of them upon good principles. In the lists of the last century, we had not more than 12

or 14 sorts. In the Horticultural Society's Catalogue, are enumerated 94; many of them are excellent fruits, and are only such as are cultivated in their garden. The French sorts are not included in this list, as many of them are supposed to be the same as some of the English ones. Of this list, 44 are scarlets, 7 blacks, 19 pines, 7 Chilis, 7 hautbois, 1 green, and 9 Alpines.

From this list of strawberries, we would recommend the following, as most deserving of cultivation in gardens.

SCARLET STRAWBERRIES.

1. OLD SCARLET, or *Scarlet*, *Early Scarlet*, *Original Scarlet*, *Virginian*, *Scarlet Virginian*, *Orange or Irish (of the Dutch)*.

2. ROSEBERRY, *Rose*, *Aberdeen Seedling*, *Prolific Pine*, *Aberdeen*, *Scotch Scarlet*. Is believed to have been discovered by accident in the market-gardens of Messrs. John and William Cadenhead, near Aberdeen, who, from certain peculiarities noticed in it, were induced to propagate it; and in March, 1815, sent packets of young plants of it to London for sale. From this stock, the gardens in England, have been supplied; it had, however, been long before cultivated in the neighbourhood of Aberdeen, and from thence spread over many parts of Scotland. It has since been ascertained, that this variety was first raised from seed by Robert Davidson, Esq., at Aberdeen, and by him given to Messrs. Cadenhead, by whom it was named and made public.

3. GROVE END SCARLET, *Atkinson's Scarlet*.

4. HUDSON'S BAY, *Hudson's Pine (of the Scotch Gardens)*, *York River Scarlet*, *Hopewood's Scarlet*, *American Scarlet*, *Late Scarlet*.

5. METHVEN SCARLET, *Methven Castle*, *Southampton Scarlet*.

6. WILMOT'S LATE SCARLET, *Late Virginian*, *Wilmot's Seedling*, *Wilmot's Scarlet*, *Wilmot's New Scarlet*, *Large Virginian*.

7. COCK'S COMB SCARLET.

The SCARLET, (*Fragaria Virginiana*,) is a native of America, growing in the woods of Virginia. The above seven sorts are all good fruits and excellent bearers, and are extremely well calculated for preserving, and are most of them early.

The ROSEBERRY, was brought into notice about 1810, and is a good bearer, and of humble growth; is well calculated for forcing; its greatest defect is, that the leaves are often not sufficiently large or numerous to protect the fruit from the scorching sun while swelling, and the fruit lying close to the ground, is apt to get dirty, from the earth being washed upon them by rains or waterings.

The GROVE END, originated at Grove End, Paddington, in the garden of William Atkinson, Esq., and is earlier than the last, and a much better bearer, producing its fruit upon longer foot-stalks, and consequently less liable to be spoiled with rain or watering. It is well adapted for forcing, and is both a handsome and well flavored fruit.

The HUDSON'S BAY, is an esteemed fruit.

The METHVEN SCARLET, originated with Mr. Thomas Bishop, an intelligent gardener, at Methven Castle, in Perthshire, about twelve years ago; is a good bearer; and the fruit of the largest size; not so high-flavored as the other scarlets. An excellent preserving strawberry.

The WILMOT'S LATE SCARLET, originated by Wilmot, a market-gardener, at Isleworth.

The COCK'S-COMB SCARLET, is a large and showy fruit.

BLACK STRAWBERRIES.

8. OLD BLACK, *Black, Black Canterbury, Mulberry, Black Beacon, Black Pine, Black Turkey, Turkey Pine.*

9. DOWNTON, *Knight's Seedling, Knight's Strawberry.*

The OLD BLACK, is a fine strawberry; a great bearer; and good flavor.

The DOWNTON, is one of our best strawberries. The fruit is large and irregular, and often assuming that monstrous appearance, called cock's-comb. The foliage is decidedly distinct from that of every other strawberry.

PINE STRAWBERRIES.

10. OLD PINE, or *Carolina Pine, Carolina, Scarlet Pine, Old Scarlet Pine, Large Carolina, Common Carolina, Carolina Pine, Solid Fleshed, Large Pine, Scarlet Fleshed, Black Carolina, Devonshire Scarlet Pine, Miss Gunning's, Varnished, Barham Down, North's Seedling, Kew Pine, Regent's Favorite, Windsor Pine, Cock's-Comb Pine.*

11. SURINAM, *Red Chili, Chinese, Red Pine, Sutton's Large, Red Pine-apple, Ananis, or Apricot (of the Dutch), Devonshire Scarlet, Oldaker's New Pine, North's Seedling.*

12. BATH SCARLET, *Bath, New Bath Scarlet, Austin's, North's Seedling. Golden Drop, Liverpool, Devonshire, Imperial Scarlet, Milne's Seedling.*

13. ROUND WHITE CAROLINA, *Globe, Cone, Chili, White Chili, Carolina, White Carolina, Large Pale Chili, Large Flesh-colored Chili, Large Blush Pine, White Blush, Large White.*

14. KEEN'S SEEDLING, *Keen's New Seedling, Murphy's Child, Keen's New Pine, Keen's Black Pine.*

KEEN'S SEEDLING, originated about 1806, by Mr. Michael Keen, of Isleworth, from seeds sown of the large white Chili strawberry. A numerous progeny was obtained, for the most part white, and by no means well-flavored. This one in particular only was saved, and possesses merits sufficient to induce cultivators to grow it extensively, particularly for the market. Fruit round; color very fine, deep crimson, which gives it a rich appearance. The seeds project considerably beyond the pulp, and to a certain degree, defend it from bruises, and thus render it more portable than almost any other strawberry.

15. KEEN'S IMPERIAL, *Large Black, Isleworth Pine, Black Imperial, Imperial, Large Imperial Black, Imperial Pine, Keen's Black, Keen's Large Fruited, Nectarine.*

Of these, the old pine is the best flavored; all the others are, however, good, and deserve cultivation; most of them under good management, attain a great size, and are very showy.

GREEN STRAWBERRIES.

16. GREEN, *Green Wood, Pine-apple, Green Pine, Caucasian, Powdered Pine, Green Alpine.* Curious, rather than possessing any particular merit, as to flavor or productiveness.

CHILI STRAWBERRIES.

17. TRUF CHILI, *Patagonian, Greenwell's French, Greenwell's New Giant, Green-*

18. SCARLET CHILI.

19. LARGE BLUSH CHILI.

20. WILMOT'S SUPERB.—This showy fruit originated a few years ago with Mr. Wilmot, a respectable fruit-grower for the London markets. It is one of the largest and most splendid of the strawberry family; but far inferior to some of the smaller ones in flavor. Our drawing was taken by Mr. Hart, in the Nursery Garden of Mr. Lee, of Hammersmith. All the varieties of Chili strawberries are large, and abundant bearers. The last of them is an admired fruit.

ALPINE AND WOOD STRAWBERRIES.

21. AMERICAN ALPINE.

22. PROLIFIC ALPINE.

23. WHITE ALPINE.

24. RED ALPINE, or *Scarlet Alpine*.

25. RED WOOD, or *Common Dutch*.

26. WHITE WOOD, or *White Dutch*. All the varieties of Alpines are good; the last four sorts are well known, and deserve a place in every garden. The first and second varieties are excellent, but as yet less generally known. Most of them will produce fine fruit from seeds of the same year's sowing, by which means they come into bearing late in the season, when all other strawberries are over.

HAUTBOIS STRAWBERRIES.

27. BLACK HAUTBOIS, or *New Hautbois*.

28. COMMON HAUTBOIS, or *Hautbois*, *Old Hautbois*, *Original Hautbois*, *Musky*, *Diacious Hautbois*.

29. PROLIFIC, or *Conical Hautbois*, *Spring Grove*, *Sir Jos. Banks's*, *Double Bearing Musk*, *Regent's*, *Hermaphrodite*, *Hudson's Bay*, *Dwarf*, *Sacombe*.

30. LARGE FLAT HAUTBOIS, *Bath*, *Weymouth*, *Formosa*, *White*, *Salter's*, *Louder's*.

All the varieties of Hautbois are esteemed for their fine musky flavor, and such varieties as become dark, almost approaching to black when ripe, are the highest in flavor.

GOOSEBERRIES.

GOOSEBERRY.—*Ribes Grossularia*, et *R. Uva-crispa*, et *Ribes Cynosbat.*, *Linnaeus*,—belong to the class and order *Pentandria Monogynia*, and rank under the natural order *Cacti*. It is not, however, certain to which of these, the gooseberry of the gardens is to be referred. Is a native of many parts of Europe, generally growing in thick jingly places. It is sufficiently naturalized, if not really indigenous to Britain, to be admitted into all our native Floras. It is here generally found upon old walls, and always near the habitations of man. The fruit was formerly in little esteem; still it is probable, that it was one of the first cultivated fruits in Britain. It has been, by cultivation, improved so much, that it bears, in a cultivated state,

little of the appearance of the original. In no country in the world is this fruit brought to such perfection as in England, and in no part of England so much as in Lancashire; the temperate and rather humid air of that county being favorable to it. In the south of Europe it is scarcely known in cultivation, although a native of Piedmont. In France it is neglected and despised. In the more temperate and humid air of Holland and Germany, it is cultivated with considerable success; and it is probable, that in the temperate parts of Poland, Russia, Denmark, and Sweden, that it might be grown in tolerable perfection. Next to the apple and pear, it is the most useful fruit we have; as from its hardy and compact habit, few that have the luxury of a garden, of the smallest size, hesitate to adopt its cultivation; and its usual productiveness warrants its introduction into every garden. It is one of those few fruits which the cottager and artisan can cultivate to perfection, and its uses in domestic economy are so numerous, as to form a part of the food of a large portion of the public for some weeks in its unripe state; and when in maturity, it is a wholesome and pleasant refreshing fruit to every class of society. So much is this fruit esteemed in this country, that means have been devised of preserving it throughout the year, both in its ripe and unripe state. The provincial names by which this fruit is known, are various. In the north of England it is called seaberry, or fever berry; in Norfolk, fapes; and in some places it is called carberry. The sorts of gooseberries are now very numerous; for the last thirty years they have increased very much. This fruit is first mentioned in 1573, by Turner, in his Herbal; by Parkinson, in Charles the First's time, who enumerates eight varieties. Rea mentions several; and Philip Miller says that there are many varieties. The catalogues of the nurseries contain from 80 to 100 names, and the Lancashire growers above 300 varieties. Forsyth mentions, as being common, 10 sorts, and that there were 43 new Lancashire sorts in his time. The catalogue of the Horticultural Society enumerates 185. The following may be considered the best for garden cultivation, where flavor is an object. Many of them are known by the title of *Old English Gooseberries*.

<i>White.</i>	<i>Red.</i>	<i>Green.</i>	<i>Yellow.</i>
Champagne	Champagne	Champagne	Amber
Chrystal	Chrystal	Chisel	Champagne
Early	Early Rough	Early	Golden Ball
Large Early	Ironmonger	Early Hairy	Golden Drop
Mountain of Snow	Little Red-hairy	Gage	Hairy Amber
Walnut	Raspberry	Walnut.	Large.
Fig	Rough Red		
Snow.	New Ditto		
	Small Ditto		
	Small Dark Ditto		
	Walnut		
	Warrington		
	Wilmot's Early		
	Early Black.		

Among these, Wilmot's Early Red deserves to hold a place in every garden. It was raised by Mr. Wilmot, market-gardener, at Isleworth, in 1804, and has been cultivated by him ever since. It is the earliest gooseberry we know, being ripe in June; and for culinary purposes in May is preferable to all others. We may add to its earliness, that it is both a great bearer, and high-flavored fruit.

The WARRINGTON, or *Manchester Red*, which is an improved variety of the old Ironmonger, has long been esteemed the best dessert fruit; and the bushes assume a perpendicular direction of growth, which occupies little space.

The RED WALNUT, is considered best for preserving whole, or drying.

To the above list, we will add—

White.	Red.	Green.	Yellow.
Royal George	Nutmeg	Gascoigne	Upright
Orleans.	Captain	Goliah	Honeycomb
	Admirable.	Globe.	Sulphur
			Conqueror
			Golden Knap.

Of these, the Green Gascoigne is much esteemed as the highest flavored of all the greens, and an abundant bearer.

The HONEYCOMB is the best-flavored yellow.

C U R R A N T S.

RED CURRANT.—*Ribes Rubrum*, *Linnaeus*,—belongs to the class and order *Pentandria Monogynia*, and ranks in the natural order *Cacti*.

Is a native of many parts of Europe, and found wild in several parts of Britain; and, like the gooseberry, never far from the habitations of man. It is very probable that it has been originally imported into this country, but by whom, or when, there is no certain account. It does not appear that the Romans, who introduced many of our now common fruits, did us this service, for neither they nor the Greeks seem to have been acquainted with it. In Italy, and over most part of the south of Europe, they have not, even to this day, any appropriate name for it. From their old French and Dutch names, they appear to have been strangers imported even into those countries; and our name of currant is evidently from the great likeness of the fruit to that of the *Uva Corinthiaca*, the small grape of Zante, or the currants of the grocers. They have, however, been long cultivated in our gardens, and have sported into several varieties. They are an extremely useful fruit, either for the table or for culinary purposes; and while foreign wines were so dear during the late war, they were made into excellent wines. Their medical properties are considerable, and their fruit is esteemed wholesome and refreshing.

There are several varieties differing in color, size, &c. the principal of which are—

Red Currant	White Currants.
Common Red	Common White
Large Red	White Dutch
Large Bunched Red	Pearl White
Large Dutch Red	White Chrystal
Dutch Red	Large New White Dutch.
Striped-leaved	
Variegated-leaved	
Wilmot's Pale Red	
Champagne.	

Of these, the Dutch reds and whites, common red and white, and Champagne, are most worth cultivating. The Horticultural Society's catalogue enumerates 24 varieties of red and white currants, from which part of the above list is taken.

BLACK CURRANTS, *Ribes Nigrum*.—Ranks in the same natural and artificial orders with the last. Is a native of the north of Europe, abounds in the woods in the north of Russia and sub-alpine regions of Siberia, where both the branches and fruit are large. It is probably an original native of this country; at all events, it is found in situations more remote from the dwellings of man than either the red currant or gooseberry. In Russia they make a palatable wine from the juice of the fruit sweetened with honey, and they also put them into brandy, as we do cherries. The leaves of the plant are a better substitute for green tea than any of the noxious ingredients usually used to adulterate that article.

The varieties of this fruit are not numerous, neither do we suppose that they are likely to be so. In the catalogue of the Horticultural Society are enumerated five varieties, probably some of them may be the same. They are, the

Wild Black Currant.—*Cassis* of the French

Black Grape.—*Ogden's Black Grape*

Black Naples

Common Black, and

Russian Green.

The common black is the only one generally cultivated.

The kinds cultivated in France appear to be the same as those above, the French names being merely translations of those used in this country

RASPBERRIES.

RUBUS, *Idæus*, *Linnæus*,—belongs to the class and order *Icosandria Polygamia*, and ranks in the natural order of *Rosaceæ*.

Is a native of Britain, and often found in woods rather moist, and almost always congregated or growing in masses together. Raspberries are recommended for gouty or rheumatic complaints. The fruit is wholesome, and the syrup dissolves the tartar of the teeth, and does not undergo acetous fermentation in the stomach.

The varieties are more numerous than has hitherto been supposed. They have not been generally distinguished by gardeners, who, it would appear, have paid less attention to them than to most other fruits. As is the case with the black currants, the French sorts appear to be nearly the same as ours, but they do not possess so many varieties.

Our lists of this fruit have not, till lately, exceeded 10 or 12 varieties; in the Catalogue of the Horticultural Society they enumerate 23, some of which possess excellent properties: of these the Antwerps, Canes, and a few others are the most generally cultivated.

ANTWERPS.

Double-bearing Yellow.
Late Bearing, *Knevelt's Antwerp*.
Red, or *Barley*.
Yellow, or *White Antwerp*.

Double-bearing,

Twice, or Double-bearing, *Red Double-bearing*, *Siberian*, or *Perpetual Bearing*
Williams' Double-bearing Red, or *Pitmaston*.

CANES.

Common Red, *Old Red*, *Wild Red*.
Rough.
Smooth.
Red.
Brentford.

<i>Reds.</i>	<i>White.</i>	<i>Various.</i>
Woodward's Globe.	Old White.	Cornish.
Wilmot's Early.		Lord Exmouth.
Malta.		Prolific Early.
Taylor's Paragon, or <i>Scarlet Paragon.</i>		Superb.
		Spring Grove.
		Barnet.

CORNWALL'S PROLIFIC, *Cornwall's Seedling*.—Cornwall's Red, and Large Red, are supposed varieties of the Barnet.

The twice-bearing ripens in July its first crop, and its second in October ; but those of the last crop, unless in very fine autumns, seldom have much flavor.

MULBERRY.

MULBERRY, *Morus Nigra*,—belongs to the class and order *Monocia Tetrandria*, and ranks in the natural order *Urticeæ*.

The common black mulberry is the only one cultivated in the garden as a fruit-tree ; but the fruits of some of the other species, especially *Morus Alba*, are sufficiently good to merit a place in a fruit-garden of the first rank. The black mulberry is, like most of our best fruits, a native of Persia, and like them have been introduced into Europe by the Romans. From the venerable specimens of this tree that are to met with in the neighbourhood of old mansions and religious ruins, we may infer that it was early introduced into this country, but at what time, or in what manner, we have no certain record. James the First attempted to establish a silk manufactory in this country, and it is conjectured that many of the old trees met with in the neighbourhood of London were planted by that monarch. That they were planted, however, by the monks, long before that period, is very certain. Tusser and Gerrard both mention them in the sixteenth century, as being then much cultivated. The fruit is very wholesome, and, like a few other fruits, do not undergo the acetous fermentation in the stomach ; but it is not universally esteemed, probably owing to its being seldom produced in perfection. They are sometimes planted upon walls, in which case, they produce great quantities of fruit, and extend their branches to an amazing distance. But when situations are favorable, they form an ornamental tree upon the lawn, and afford very good crops of fruit. One or two trees will afford plenty of fruit for an ordinary family, and may be procured in the nurseries of a size sufficient to produce fruit the year after planting. This fruit has been found by Mr. Knight to be much improved by being cultivated in pots under glass, and produces crops more abundantly under such circumstances than any other tree with which he is acquainted. Its blossoms set equally well in different degrees of temperature, and the same degree of heat that will ripen the earlier varieties of grapes in the end of July, will afford perfectly ripe mulberries early in June. Dwarf-trees of this species of fruit may be readily obtained (for this purpose) by enarching upon a young stock the bearing branch of an old tree. Plants thus prepared have yielded above twenty dozen of mulberries in one season. The plants growing in ordinary-sized pots, and not three feet high.

CRANBERRIES.

CRANBERRY, *Oxycoccus Palustris*, and the American species *Oxycoccus Macrocarpus*,—belong to the class and order *Octandria Monogynia*, and rank in the natural order *Ericææ*. The former is a native of peat-bogs in many parts of the north of England and Scotland, and the latter is a native of similar places in North America. It was brought into notice by the late Sir Joseph Banks, about 1812, and cultivated by him in his garden at Spring Grove. The former species is now also occasionally cultivated in our gardens; and is collected from its natural place of growth in vast quantities. In the north of Europe, great quantities of them are yearly preserved in bottles, and sent to Stockholm, whence they are exported to different parts of the world. A great portion of them is annually brought to the London market.

N U T S.

OF nuts there are many names to be met with in the nursery catalogues; but those in the following list are by far the most useful, and are in very general cultivation:—

WALNUTS.

Tender-shelled	Round Early Oval
Thick-shelled	Double Large French.
Highflyer of Thetford.	

Of these the Highflyer of Thetford and Tender-shelled are considered the best.

CHESTNUT.

Of this tree, as with all others originated by seeds, several varieties exist; some ripening a few days earlier than others, and some attaining a larger size than others. But of these none have been fixed upon by cultivators, or propagated for their respective merits.

FILBERT.

Spanish or Barcelona	Large Long Nut
Red-kernelled Filbert	Common Hazel Nut
White-kernelled Do.	Red-kernelled Do.
Great Cob-nut	Cossford
Frizzled.	Constantinople Nut.

Of these the common and red-kernelled hazel nut are well known, and often met with in great abundance in woods. The Cossford and Frizzled are noticed in the Hort. Trans. and recommended as superior sorts. The Constantinople nut is not in very general cultivation, but has considerable merit as well as all the others.

Fruits Neglected, or not in General Cultivation.

To this we may refer the Cloudberry, *Rubus Chamæmorus*; Common Bramble, *Rubus Fruticosus*; Tree Currant, *Ribes Spicatum*; Dwarf, or Artic Bramble, *Rubus Articus*; Dewberry, *Rubus Cæsius*; Snowberry, *Gaultheria Serpyllifolia*, and many of the genus *Vaccinium*, which possess great merit; and in sufficiently cold and leathy situations would amply repay the expense of cultivation.

FRUIT GARDEN.

FOR the following select lists of fruits for general purposes, and which may be considered a sufficient variety, under all reasonable circumstances, for a garden of the first class, we are indebted to a friend of the highest professional attainments, who has cultivated them, amongst many others, for several years. We prefer thus giving a list of select fruits actually cultivated in one garden, to a selection made in any other way; and as we have witnessed the excellence of these productions, we have the more confidence in recommending them. The list is short, compared with what many may expect; but such is the case, few tables in the kingdom are supplied with a dessert more elegant and profuse than that of the opulent proprietor from whose garden these lists are taken. This shows, by example, what may be done by a judicious selection of a moderate number of sorts of fruits in the first instance, and a proper management of them afterwards.

APPLES.

Alexander	Lemon Pippin
Blenheim Pippin	*Lucomb's Pine-apple
*Brandsley Pippin	Margill
White Calvelle	*Scarlet Nonpareil
Dutch Codlin	*Ross's Nonpareil
Keswick Codlin	*Russet Nonpareil
*Court of Wick Pippin	*Green Nonpareil
*Scarlet Crofton	Scarlet Nonesuch
*Downton Pippin	Northern Greening
French Crab	Yorkshire Greening
Late Fulwood	Loan's Pearmain
*Golden Pippin	*Padley's Pippin
*Russet Golden Pippin	Golden Reinette
Franklin's Pippin	Golden Russet
Hall Door	Ribston Pippin.
Hawthorn Dean, White	

Those marked (*) are dessert apples; although many of the others are also fit for that purpose.

PEARS.

D'Auch	Passe Colmar
Gansell's Bergamot	Crassane
Autumn Bergamot	Jargonelle
Brown Beurré	Marie Louise
Red Beurré	Napoleon
Beurré Du Val	St. Germain
Chaumontel	Bishop's Thumb
Colmar	Swan's Egg.

PLUMS.

Coe's Golden Drop	Magnum Bonum, White
Green Gage	Precoce de Tours
Imperatrice	Sharp's Emperor
Early Orleans (<i>Wilmot's</i>)	Goliath
Orleans	Wine Sour (for preserving).

APRICOTS.

Breda	Orange
Brusnells	Turkey.
Moor Park	

CHERRIES.

May Duke	Bigarreau
Late Duke	Harrison's Heart
Black Heart	White Heart
Black Tartarian	Morella.

FIGS.

Black Ischia	Lec's Perpetual
Brown Ischia	Brown Turkey
White Genoa	White Naples.

PEACHES.

Scarlet Admirable	Vanguard
Double Swalsh	Royal George (<i>smooth leaved</i>)
Early Vineyard	Purple Hative (<i>late</i>)
Red Magdalen	Grosse Mignonne
Noblesse	Millett's Mignonne
French Mignonne	Buckingham Mignonne.

NECTARINES.

Dutilly's	Vermash
New Scarlet	Murray's
Roman	Newington
Voilette Hative	New White.

PINE-APPLES.

Black Antigua	Otaheite (<i>Anson's</i>)
Brown Antigua	White Providence
Enville	Queen.
Black Jamaica	

VINES.

*Alicant	*Black Morocco
Black Prince	*Black Muscadel
*Chasselas	Royal Muscadine
Black Frontignac	White Nice
Grizzly Frontignac	*West's St. Peter's (<i>Oldacre's</i>)
White Frontignac	Dutch (<i>or Sittwell's</i>) Sweet-water
*Muscat of Alexandria	Sweet-water (<i>common</i>)
Black Gibraltar	*Black Damascus
Black Hamburg	Frontignac Musqueé.

Those marked (*) are late grapes, and consequently require heat; are, therefore, fit for pine stoves, or to be cultivated in houses by themselves.

THE
FORCING GARDEN.

INTRODUCTION.

To accelerate, as well as to cultivate by artificial means, those fruits which are natives of more temperate or tropical climates, "constitutes one of the principal branches of modern gardening:" hence it becomes necessary to form climates suitable for their growth, and these climates are formed in those erections generally denominated hot or forcing-houses. In regard to the period when the acceleration of fruits was first practised in this country, we have no certain information. Some suppose that the Romans hastened the ripening of grapes in this country under talc cases, similar to the modes used by them in Italy; while, on the other hand, it is the opinion of others, that no attempt had been made to force the ripening of fruit before the sixteenth century.

Parkinson and Gerarde both describe the practice of growing cucumbers and melons, by removing them into sheds or rooms at night, and exposing them in fine weather during the day. This seems to have been the most primitive mode, having been practised in Italy in the time of Tiberius, and probably was succeeded by merely covering with glass-cases, being in itself an improvement on the talc cases used by the Romans, as described by Seneca and Pliny. The next step towards improvement, was the use of fermenting vegetable matter in the formation of hot-beds, and afterwards of hot-walls, and lastly the construction of hot-houses, which took their rise about the end of the seventeenth century, and which are now arrived at that degree of excellence, that is not likely to be surpassed. In the time of Charles the First, melons were cultivated on

beds of hot dung, without any other covering than occasionally a little straw thrown over them; and, according to Switzer and Lord Bacon, this practice had been in use for an unknown length of time.

In the time of Charles the Second, hot-houses, according to Daines Barrington, were erected, and all the fruits which we have at this day were cultivated, the pine only excepted, which was introduced in 1690. Switzer, in the beginning of the eighteenth century, not only erected hot walls, but also forcing-houses; the first plans of which, together with directions for their management, he published in 1717, in his *Fruit Gardener*. Little progress was, however, made in this branch of gardening till towards the middle of the eighteenth century, and since that time, the erection of hot-houses has rapidly increased, and their management upon scientific principles has kept pace with their increase; for which reason a garden is now considered as incomplete without several of those structures.

An invention so important as that of the erection of hot-houses, naturally led to a variety of opinions regarding their construction, and various are the ideas still entertained on this subject.

The principal points on which hot-house builders disagree are; *first*, the materials of which they should be formed; *secondly*, the form of roofs best calculated for the admission of the rays of heat and light; and *thirdly*, the way by which they should be heated.

These are the principal points on which experimental men differ, and each advocate has supported his theory with much philosophical reasoning. Houses have been built on a variety of principles, for the purpose of proving by experience their merits or defects.

These differences, although they appear specious, and afford a vast field for controversy, are considered by most practical gardeners as of far less importance to the end in view, than is willingly allowed by their several advocates; as much more depends on the proper formation of borders, and the general subsequent management, than on the simple construction of the house. We find able gardeners producing good crops of

fruit in all kinds of houses, while bad ones are less fortunate; and therefore they may as well lay the blame on the construction of the house, as on their own inattention and want of skill. Nevertheless, it is allowed, that many houses are faulty, but if those be partially successful, the success must necessarily be greater, were they to be constructed on a more approved principle. However, where there is a sufficient command of fire-heat, as well as a sufficient quantity of light and air, whatever the form of the house may be, if the borders be properly prepared, and the management good, the success will entirely depend upon the experience and attention of the gardener.

SITUATION.

“It is a matter of importance,” as Nicol very justly observes, “that every hot-house should be placed, if not in a sheltered situation, at least in a dry one, or in one that is capable of being rendered so by draining. The aspect of all forcing-houses should be as near to the meridian as possible, though the deviation of an hour to the east or to the west is not of much importance. Some insist that they should front the east, and others that they should front to the west of south, because some are advocates for the morning, and others for the afternoon sun.” If they stand within a few points of south, it is matter of little consequence whether that inclination be to the west or east; it is, however, otherwise with houses constructed for the cultivation of plants only.

As the subject of plant-houses will be fully considered in the latter part of this work, we will confine ourselves at present to those houses which are intended for the cultivation of fruits; and, in the first place, we must observe that, for that purpose, the houses should front the south, and be completely sheltered from the effects of winds, but still not so as to be shaded by trees. Low and damp situations are, of all others, the least calculated for such structures, and the generally adopted site for them is in the kitchen-garden; although, in some instances, the forcing structures, when upon an extensive scale, as in the royal gardens at Kensington, are in an

enclosure by themselves, and not unfrequently are placed in the flower or pleasure-garden, as at Sommerly, the seat of H. Baring, Esq., M. P., in which latter instance, the effect is good. However, it must be admitted, that the most convenient situation for them is the kitchen-garden, as the operations carried on, are in both more intimately connected. Such structures are generally placed against the garden-walls in a continued range, and are usually built on the ground-level of the garden. Some instances occur, where the houses are scattered about in different parts of the garden; but to this it has been objected, that they are much less conveniently attended to, and produce an appearance of confusion, by breaking in upon the regular quarters, and presenting their back-walls, which, however well covered they may be, have no inviting appearance. Houses in short ranges are more convenient for the operators in attending to them, and when seen from a proper point on entering the garden, produce a good effect. Where the soil is damp, there can be no objection to have the floor-level of the hot-houses elevated above the garden-level, by which the roots of the trees will be completely secured from under-damp, and, if not too much elevated, the houses will have a bolder effect. In long continued ranges, we have found it extremely inconvenient when they are closely connected, and therefore we prefer the mode exemplified by that eminent architect, W. Atkinson, Esq. in many first-rate gardens, by leaving a convenient space between each division or range.

MATERIALS OF WHICH HOT-HOUSES SHOULD BE FORMED.

About the beginning of the present century, in consequence of the high price of timber, various sorts of metallic substances were brought into notice as substitutes for wood. The chief advantages of metallic houses are stated to be, *durability*, *elegance*, and *lightness*. The first of which is very doubtful; the second, a matter of taste only, as numerous instances occur of hot-houses which are built of wood being as elegant, and as neatly fitted up, as any that have been erected of metal; and the third, unimportant, inasmuch as the houses hitherto constructed

of wood, if done in a neat and proper manner, have been found to admit light sufficient to produce fruit as good as any that has hitherto been produced in metallic ones, without the danger attending the attraction of electrical matter, or their conducting an immoderate degree of heat or cold, either of which is extremely injurious to vegetation. A sufficient time has not yet elapsed to prove their durability to be more than that of good timber, which only should be used in erections exposed to the vicissitudes of heat and cold, wet and dry; but if we may judge from metallic matter being used in sky-lights, and other open situations, exposed to the same atmosphere, and governed by the same laws, we should decide that wooden houses, if properly constructed and kept in repair, will last as long as metallic ones, if kept equally well. Iron is not incorruptible, and it is much to be questioned, that were it placed in the same situation, whether it would remain in a state of preservation much longer than many kinds of wood. Nails are sometimes found quite decayed in old buildings, while the timber, in which they are driven, is almost as fresh as when first put up. *Lignum vitæ*, as well as ebony, is so durable, that scarcely any traces of decay have been discovered in either. Box is very rarely found in a state of decay. It was a common opinion in the days of Pliny, that box, ebony, cyprus, and cedar, were indestructible. The great durability of these woods arises, no doubt, from their texture, being very heavy and close-grained; water cannot be absorbed by them in any quantity, they not being sufficiently porous. We have woods in another class which are very durable, such as mahogany, cedar, yew, teak, acacia, and some species of pines, &c. These woods are of an open grain and very porous, but then, they contain a quantity of oleaginous or resinous matter, which occupies all their cavities, and therefore prevents the insinuation of any moisture. Pliny, in his *Nat. His.* lib. 16. c. 40, says, that the Temple of Apollo, at Utica, the timber of which was Numidian cedar, is said to have stood 1188 years. The roof of Westminster Hall is of oak, and has stood undecayed during a period of many centuries.

The horizontal cyprus, *Cupressus horizontalis*, a native of the Levant, is said to resist putrefaction, and to last for many

centuries. According to Thucydides, the coffins used by the Athenians, for their dead heroes, were made of this wood; as also the chests which contained the Egyptian mummies. The doors of St. Peter's church, at Rome, were originally made of this wood, and after lasting eleven hundred years, they presented, at the end of that time, not the least symptom of decay. They were removed by order of Pope Eugenius the Fourth, and gates of brass were substituted in their place.

The durability of the larch is now well ascertained, and when properly seasoned, it is not liable to warp, nor cast, as it is technically called; and, when of a proper age, it might be used as a durable timber for hot-house building. Its durability was known to the ancients, who describe it as lasting for nearly a thousand years.

Innumerable instances are recorded, and which daily present themselves to our notice, of the durability of *deal* timber; and when that wood is highly charged with oleaginous or resinous matter, it is known to last for many years, and is well calculated for hot-house building, as having but a slight tendency to warp or shrink, however openly it may be exposed. We are much disposed to believe timber of this description to be more durable for hot-house building, than metal of any of the sorts which have hitherto been used; and while it is exempt from the charge of being a conductor of excessive heat, cold, or electrical matter, it is also not liable to contraction nor expansion. Rust never affects it, the droppings of which on the foliage of plants is extremely injurious; neither is the expense so great in the first erection, and any accidental injury sustained in it can be more readily rectified. The capability of good timber to support any reasonable weight which is ever likely to be applied to the roofs of hot-houses, is such as to warrant, with all safety, the rafters and sashes being made sufficiently slender, to admit as much light to the plants as is ever required, on any reasonable occasion. It has been stated, that if one-third of the sum requisite to keep a wooden-house properly painted, be expended on an iron roof, no injury would ever be sustained, from the liability of that metal to suffer from rust, but this is not the case. The disposition of rust to eat its way through paint is so obvious,

that we are really surprised, that the intelligent gentleman, who has promulgated the above opinion, has not been practically convinced of the fallacy of his argument. It is advised by him and by the most strenuous advocates of iron houses, to paint them every year, with the view of counteracting the effects of rust, and rendering them less powerful conductors of heat; now it is singular, that one-third of the sum will paint a hot-house of any given number of superficial feet yearly, while a wooden-house of the same surface, requires that operation at least only once in two years, and if it should even be performed only once in three or four years, little or no injury would accrue to the timber; while, during the whole of that time, we are free from the ill effects of rust, expansion, contraction, and all danger from the conducting powers of iron.

There is no example of any iron-house having yet stood thirty years, but we have seen many that have stood that time, which have been built of timber, and, according to all moral calculation, are likely to stand much longer. An instance of this occurred in our own practice, while at Stratton Park, in a vinery, which was built when that property belonged to the Bedford family; it had been long neglected, and not kept in the slightest repair, nor probably ever painted from the time it was built, till it was taken down, when it became, by purchase, the property of the late Sir Francis Baring. This vinery, however, stood for upwards of thirty years, and was by the present proprietor taken down, about ten years ago, to make way for a metallic one, which was constructed by one of the most eminent metallic hot-house builders in the kingdom; the old sashes and rafters were thrown by as useless, and remained for seven or eight years neglected. The rafters and such pieces of the building as could be wrought up into use, were taken, in consequence of the extreme good quality of the timber; and the sashes, not being so convertible into general buildings, were left to perish, as of no use. In 1825, some houses were erected for vines, and one of them was covered with those identical sashes, which had now been made about forty years. These sashes were in so good preservation, that any repair was judged unnecessary, except for greater strength. The corners were secured with plates of iron, to

strengthen the joints, and so hard was the putty, that the glaziers had much difficulty in cleaning the rabbets out for the reception of the new glass.

This is not a solitary instance of the durability of wooden hot-houses, as many others could be adduced. It is, however, to be acknowledged, that from the nature of the material, and from accidental injuries sustained, at the same time that no means are taken to guard them against decay, that parts of wooden houses may show symptoms of decay sooner than iron ones; but the nature of the material also admits of their being readily repaired, which is not the case with those constructed of metallic substances. It does not often happen, but we have known an instance of a person, while in the act of repairing the roof of a hot-house, falling through one of the sashes, which was so much injured as to require it to be taken off and repaired, which was done in the course of a day; should such a circumstance, however, occur in a house of iron, could the injury be so readily rectified? The answer must be decidedly in the negative. If the sash so injured be of cast-iron, and the accident occur during winter, or while the forcing is going on, could it be remedied without its being sent to Birmingham, London, or to some part probably equally distant, for the purpose of having another cast, to replace it, during which time the gardener would be placed in an awkward situation? If the sash were made of copper, wrought iron, or of any other metallic matter, the repair to be effected would require infinitely more time and expense than if it were of wood.

Copper, or other compound metals, in consequence of their want of sufficient body in the smaller members of the sashes, are liable to yield to a slight pressure; heavy falls of snow would produce a bending in them, sufficient, not only to break much of the glass, but also to bend them hollow in the middle, and, consequently, render them less likely to throw off the rain, if it do not altogether dismember their joints.

Metallic mixtures, as iron cased with copper, produce unequal expansion, and also tend to break the glass, in consequence of a twisting in the bars. Wrought-iron is not so apt to be affected by this expansion, but is equally unfit for hot-house building, being so liable to rust.

Cast-iron is not so liable to rust as the last, neither is it so materially affected by expansion, as to cause any considerable breaking of glass, but then sashes of cast iron are less calculated to bear any degree of pressure, and are liable, in consequence of their extreme brittleness, to break off short upon any sudden blow, or pressure being put upon them suddenly; and above all, when once they are broken, they are not readily repaired without being recast, and the time lost, and the expense of the repairs, form surely a heavy balance against them. They cannot either be constructed on so slight a principle as houses of the mixed metals, or of wrought iron, and consequently are so heavy, that they will, in the end, hasten their own decay. Their weight on steep roofs is not easily supported; and when the ropes by which they are let up and down, in the process of giving air, break, which is no uncommon circumstance, their ponderous weight in falling shakes the whole fabric, and the fragments of some twenty or thirty squares of glass, bear evidence of the extent of the disaster. This we have frequently experienced, and it must be admitted that such accidents occur also in wooden houses, but the concussion is not so great, and the effect produced is seldom to any extent injurious.

That metallic houses, from a variety of causes, break more glass than wooden ones is evident. The light which supplies that herculean undertaking, the Colosseum, in the Regent's Park, is admitted by two immense sky-lights of metallic construction: during the few extremely hot days of the summer of 1827, some hundred squares of glass were daily broken by expansion; of this fact the ingenious and able projector is perfectly sensible, and being convinced, not only of the prevailing fault, but also of the attendant expense and inutility, has used nothing but wood in the erection of a range of conservatories, green-houses, and stoves, upon a scale and plan entirely unprecedented in this country. The public will soon be satisfied that houses can be constructed as elegantly and lightly, and at a much less expense, of wood, than of any metallic matter whatever. There are few of the numerous visitors, who have seen them, that have not supposed them to be iron, until informed of the contrary.

In one conservatory, Mr. Horner has adopted an ingenious plan of combining strength and lightness in the rafters. The roof is of an elliptical form, and the sashes are fixed. The rafters are composed of one bar of wrought iron, three quarters of an inch thick, and three inches broad; this bar of iron is covered with deal timber half an inch thick, and secured to the iron bar with neat screw-bolts, so that they have the appearance of being wholly of wood, and their size is consequently only one inch and three-quarters thick, and four inches deep which has a very light and neat appearance, while it is sufficiently strong to carry the weight of the roof. If strength and lightness be really indispensable for hot-house rafters, this appears to be the principle by which it can be effected, as by being covered with wood, all the conducting powers of heat, cold, or electricity are corrected, and the effects of contraction or expansion lessened, so as to be attended with no bad consequence; and it is probable that rafters so constructed, will be more durable than metallic ones, exposed to the action of the weather. However, the expense of such rafters is considerably more than wooden ones of equally proportionable strength.

The rafters of the peach-house in the garden of the Horticultural Society are also strengthened, by having bars of iron introduced into them, in a similar way, as are the rafters in the conservatory of Mr. Hope, at Deepden; both houses are designed by William Atkinson, Esq., and in both of them the rafters are neat, light, and of sufficient strength to support any weight ever likely to be applied to them.

Metallic houses attract electricity, and to guard against this evil, it has been recommended to cover with thick coats of paint. Most painters consider that paint put on in thick bodies defeats the purpose for which it is intended, by not adhering so closely to the body on which it is placed, as thinner coats of the same material, and, instead of protecting the body of the material, is constantly peeling off. Putty is also recommended to be spread over half the bar, to lessen the conducting principle; most glaziers agree that the smaller the quantity of putty used, the less liable it is to loosen or fall off; and this is accounted for upon nearly the same principle, that thin coats of paint are better than thick ones. There is certainly

no instance within our knowledge of any *material* injury being produced by the effects of the electric fluid, but that is no reason why such should never be the case. Accidents of that nature so seldom happen, under ordinary circumstances, that it is by no means a matter of surprise that it has not happened in the case of metallic houses, when we consider the comparative few in number throughout the kingdom.

Practical gardeners are, and have been, doubtful of the success of such houses. Abercrombie and Speechly in England, and Nicol in Scotland, excellent practical and experimental gardeners, were decidedly against them, and most others have avoided giving their opinion. Mr. Atkinson, who has designed and built more hot-houses than probably any other architect of the day, is also decidedly against them. Those who have adopted them are chiefly amateurs or philosophical gardeners; some few practical men have had the management of them, and one or two have built from their own designs. The most extensive erections of this sort are now building, under the direction of Mr. Forrest, at Sion-house. "The result of his success will, probably, tend to set the matter at rest."

ON THE FORM OF ROOFS, &c.

The form of hot-houses, till of late years, was generally that of a straight front, with sloping roofs, supported in front on a parapet wall, sometimes with and sometimes without any upright or front sashes, and differing in their angles of elevation, to suit the purposes for which they were intended, but, in most instances, they were built without any premeditated design thereto, or to that effect. Mr. Knight, however, about the beginning of this century, revived the theory of Boerhaave, Professor of Botany at Leyden, "who exemplified a principle which he laid down, for adjusting the slope of the glass of hot-houses, so as to admit the greatest number of the sun's rays, according to the latitude of the place."

This was adopted by the celebrated Linnæus, and afterwards enlarged upon by Faccio, Adanson, Miller, Speechly, and others. In 1815, Sir George M'Kenzie introduced into notice the hemispherical form of roof, as being supposed to be

the form best calculated for the admission of the greatest number of the sun's rays. And this has been "considered (by some) as the ultimatum in regard to the principle and perfection of form;" while others, and by far the greater number, still prefer the sloping roof, suiting the angle of elevation to the purposes for which they are intended, and relying more upon good management, than upon nice points of philosophical reasoning, as regards the form of the house. Sufficient time has not yet elapsed, to prove the superiority of curvilinear roofs over those that are straight, as affecting the plants that may be placed under them. It, therefore, remains as yet a matter of taste only as to which of them has the best effect in garden scenery, and as taste is governed by no fixed laws, it is not likely to be speedily determined. In houses built expressly for the cultivation of exotic flowering plants, "fancy may have its full sway;" and houses for those purposes may be built upon principles of taste, with less injurious effects to the inmates; but in houses built expressly for the purpose of accelerating or cultivating exotic fruits, the principle of the design, as regards architectural beauty or taste, is of much less importance than the consideration of the end in view.

Some few curvilinear houses have been erected in this country, but they have chiefly been for the cultivation of flowering plants. Whether it be that their expense in the first erection, their inconveniency, or the effect that they produce as a garden structure, have operated as a drawback, is not certain, but they are not rising much in repute. That their expense in the first erection is considerably more than that of houses built upon the more common principle cannot be denied, inasmuch as a great part of the materials, if of wood, is cut to waste, and their formation more difficult for the tradesman to execute; and above all, if the sashes be made moveable, which should be the case with all houses, whether they be ventilated by the sashes, or by means of ventilators properly constructed, and placed both in the front parapet-wall, and likewise near the top of the back one, they are, in that case, incapable of being made rain-proof. For houses entirely constructed for cultivating flowering plants, they may, with less impropriety, be made of fanciful shapes and curvilinear roofs; but for houses

expressly built for utility, they are not to be recommended. As they are constructed upon the principle of admitting the greatest number of the rays of heat and light, they also admit of the greatest portion of cold, particularly in windy weather, by allowing it to pass more readily into the house between the laps of the glass. Our own experience, in respect to two curvilinear houses for cultivating tropical plants, justifies us in joining to the testimony of others, in stating them to be decidedly more difficult to keep to a proper temperature, than houses with sloping roofs, glazed upon the same principle, and of the same dimensions. Indeed, so difficult was it to keep the required temperature in the houses alluded to, notwithstanding there were two fires constantly kept up, and the dimensions of the houses only forty feet long, by eleven wide, and one of them only ten feet high, that we were under the necessity of covering them with double mats during a great part of the winter of 1827.

The majority of practical gardeners prefer those with straight roofs, and are content with the light and heat that they afford, and if we may judge of their relative merits, by the crops of fruit produced in both, we see little reason to think that they will ever become general. Economy, combined with utility, we have always considered as a most important consideration in hot-house building, provided that they be so contrived that the plants may derive the due advantages of light, air, heat, soil, and water, these being the principal agents of vegetable life. The merits, therefore, of hot-houses will be judged by the perfection with which those indispensable agents are supplied.

In our opinion, curvilinear houses have no advantage over others for the production of good fruit; and, as a mere matter of taste, we see no elegance in them that is not to be met with in well-constructed houses with straight or sloping roofs, if judiciously arranged, either in ranges or detached. In ranges (against walls) curvilinear houses have the appearance of being unconnected, even though they may be joined; and, if detached, they as much resemble huge bird-cages as houses for the cultivation of fruits. The most convenient and economical form of house seems to be that of a straight front resting upon a parapet of brick or stone, of a proper width, and pre-

sending an angle to the horizon suited to the purpose for which it is intended; if for late forcing, or pine-stoves, an elevation generally of thirty-five degrees will answer; but if for early forcing, the elevation will require to be more upright, to admit of the rays of the sun acting sufficiently powerful in the early part of the season, when the sun is low in the horizon.

ON HEATING HOT-HOUSES.

Hot-houses are generally heated by means of combustible matters consumed in an oven or furnace, which is generally placed behind the house, although sometimes placed in front, or at the ends. The heated air, together with the smoke, is made to pass into the house enclosed in a flue, which, for the most part, stretches along the front part of the house, at some little distance from the parapet wall. This distance is greater or smaller, according to circumstances, but the flue should always be placed as near the front as convenient, that being the coldest part of the house. As the heat naturally ascends, it is necessary that the first and greater heat should be allowed to escape as near the lower part of the house as possible, and if a sufficient heat be kept up here, it will readily heat the higher parts.

Steam, of late years, has been employed in heating hot-houses, but the expense of getting up the apparatus, and of keeping it in repair, has prevented it from being brought into general use. Upon a small scale, it is not advisable, as the expense is much greater than the more original method of heating by means of brick-built flues.

In 1792, Mr. Butler, then gardener to the Earl of Derby, was amongst the first who tried the application of steam in heating a cucumber-house, and it was the first successful attempt in that improvement. The idea, however, was suggested a few years previously by a person in Liverpool. Little notice was taken of it till 1816, when it was revived, and has since been tried in many places; in some it still continues to be used, and in others it has been abandoned, in consequence of the expense. Fuel, in most parts of the kingdom, is an expensive article, therefore the mode of heating hot-

houses, so as to consume the least possible quantity, is a desideratum. "Heat is the same material, in whatever manner it may be produced, and a given quantity of fuel will produce no more heat when burning under a boiler, than when burning in a common furnace."

FLUES.

Various opinions have been entertained respecting the proper size and situations of flues, and the materials of which they should be constructed. The most primitive mode of their construction appears to have been under the surface of the borders, like drains, or in the solid walls of the house, and of large dimensions. Experience, however, soon proved the error, and we have long found them built upon more correct principles. Large, broad, and deep flues are used by the Dutch, and have been recommended by a writer in the *Caledonian Horticultural Memoirs*. Deep and narrow flues are used in Russia, and are often met with in this country. Can-flues have been used for a long period, but as they are rapidly heated and soon cooled, they are only adapted for moderate fires; but, judiciously chosen, they may frequently be more suitable and profitable than common flues, as for example, where there are only slight fires wanted occasionally, as in the case of a vinery with late grapes, only requiring a slight fire to dry up moisture, or repel a slight degree of frost, or where there is a regular system of watching the fires; in which case, but not otherwise, the temperature can be sufficiently regulated.

Cast-iron flues have been recommended on account of their durability, but unless they were bedded in sand or masonry, they are liable, in an extreme degree, to the same objections as can-flues. Sir George M'Kenzie, the inventor of curvilinear hot-houses, has recommended what he terms an embrasure flue, upon the principle of its exposing a greater surface of heated material in proportion to its length. It is evidently a very unsightly flue, and possesses no merit to induce our recommending it. Mr. Gowen, in the *Horticultural Transactions*, recommends a flue formed of bricks, which is hollowed out in the middle, and of the usual thickness at the

edges; they possess the advantage over common bricks, in the more rapid transmission of heat, and being easier heated; but, on the other hand, the refrigeration takes place as rapidly, for want of sufficient body to retain the heat.

An improvement upon these bricks has been invented, and adopted by Mr. Mackay, of the Clapton Nurseries, in the extensive and convenient houses which have been built by him; the thickest part of the bricks used by him is less than that in common use, and the middle of each is hollowed out to about half their thickness; they are very neat bricks, and no doubt exists of their answering the purpose for which that intelligent and industrious cultivator has designed them. They will evidently heat the atmosphere of the houses sooner, and with less fire, which is extremely important to nurserymen; but they will, of course, be cooled exactly in the same proportion, for want of sufficient body to retain the heat. For green-houses they are admirably suited, as slighter fires are necessary for them, and their application generally requires to be more sudden to repel sudden attacks of frost; but for the forcing of fruits, where steady and uniform fires are required, we would prefer bricks of the usual form and size, which, although they require a little more fuel to heat them, when once charged with heat, they retain it equally long, and give it out gradually for a greater length of time. Tiles, as broad as the flue, or nearly so, and a foot or fourteen inches long, should be used for covers, and should be made hollow in the middle of their upper surface, for the purpose of holding water for steaming the house.

Flues should be built clear of the ground, and detached from the other walls, so that the heat may not be prevented from escaping freely from their sides. The bottom of the flues should stand clear of the floor of the house, the thickness of one brick at least, if more, so much the better, but not so as to raise the flue to an objectionable height. The sides should be built of well-formed bricks, laid on edge, closely jointed with washed lime, mixed with brick-dust, and should not be plastered either outside or inside. If the bricks be well laid, and neatly jointed, the flue will present a much neater appearance than if plastered all over. The covers may be

flush with the outside of the flues, but should never project over them. If they be an inch, or even two inches, narrower than the full breadth of the flue, so as to allow of a little mortar being drawn in to fill up the angle, they will present a lighter appearance. Where only one course of flue can be admitted, the broader it is, the more heat will be given out as it proceeds, and consequently one extremity of the space to be heated will be hotter than the other; a return, or double course of a narrow flue, is, therefore, almost always preferable to one course of a broad flue.

Flues vary in size, from six inches in width, and twelve inches in height, to ten inches wide, and eighteen inches high; this should, in a great measure, be regulated by the purposes for which they are intended. The intermediate size between these may, generally, be employed in most forcing-houses; some, however, build their flues much larger, and, instead of laying the bricks on edge, lay them flat, from an idea that the greater the body heated, the longer will it be in cooling, and, consequently, continue to give out its heat for a greater length of time. This is indeed true, but then it requires an equally greater length of time, and a greater force of fire to heat them thoroughly, so that what is gained on one hand is lost on the other; and if ever the temperature be allowed to fall below what is required, flues of such dimensions will not heat the house so rapidly, as those of less size, and will likewise require a greater quantity of fuel.

Much has been said upon the subject of hot air-flues, but they are now almost very justly exploded, as being worse than useless. Nicol was at some pains to prove their inutility, and he proved it in the following manner: "The idea," he says, "of collecting the heated air from a furnace, and conducting it to the cold end of the house is just and natural enough; but if this cannot be done without conducting the tube or flue, which conveys it, upon the fire-flue, to the evident loss of its surface, and of its best part, I would ask, what is gained by the experiment, or rather, what is lost by it? Evidently a great deal: all the expense, and double the quantity of heat, that can be thus conveyed. The fact is, there is no heat comes to the far end of the house, but just what is collected from the

fire-flue into the air-flue, as it travels along. None of it comes from the furnace. I had," he says, "a suspicion of these truths, and, in order to put them to the test, had tubes of various shapes, sizes, and lengths made, and which I could lay on the fire-flue, on the ground, or on a shelf, or, in short, any where I pleased. They were all fitted to the air-chamber formed round the furnace, which had a turning valve in front, three inches in diameter. That, with which most of the experiments were made, was a square tube of three inches wide formed of milled clay, and baked in the same way that garden-pots are. It was of lengths of three feet each, and joined with cement. I tried its effects in conducting the heated air from the furnace, at various lengths and at various heights; from two yards in length to forty feet, and from one foot above the level of the furnace to ten. The result of the whole amounted to this: that, unless when on the top of the fire-flue, air perceptibly hot, could not be drawn from the furnace, to a distance of more than twelve feet, even although the furnace was made ever so hot. When the tube was shortened to two lengths (six feet), the air issuing from it raised the mercury in the thermometer to 120° ; but when another length was put on, though the fire was kept equally brisk, it fell to 96° ; and, by adding a fourth length, (the tube being now twelve feet long,) the mercury was not affected by the air of the tube, but fell to the air of the house. The above experiment was made at six feet above the level of the top of the furnace. It was tried at two feet above it with hardly any variation; but, when laid on the ground, on the same level with the top of the furnace, the heat did not travel to the length of nine feet, so as to affect the spirits in the thermometer."

FURNACE.

The furnace recommended by Mr. Atkinson is the best, and has now been very generally in use for upwards of thirty years, and is nearly similar to that recommended by Nicol, and is of a size capable of containing less or more fuel, according to circumstances. The most usual size is thirty inches long, twenty high, and ten broad. The door of this furnace is ten

inches square, with a circular valve in the centre three inches in diameter. The grating is thirty inches long, and of the same width as the door. The ash-pit is also furnished with a door of the same form and size as that of the furnace, but fifteen inches deep. The circular valve in this door is supplied with a handle to turn it by, for the purpose of admitting any quantity of air to the extent of half its diameter. The bottom of this oven is placed twelve inches at least below the level of the bottom of the flues, and is paved with fire-bricks. The walls or sides of the oven or furnace are composed of the same material, as is also the arch or roof, and fire-clay is used instead of lime. Furnaces of this description have given much satisfaction, and are sometimes of larger dimensions, particularly when wood, or wood and peat, are used for fuel, and are sometimes smaller, when coals, or coals and cinders, are used only.

Small furnaces have an important advantage over larger ones, in requiring much less fuel to heat the flues, which when fully heated or charged with heated air, the heat is shut up in them by means of a damper placed at the extremity of the flue farthest from the entrance of the fire, or where the flues terminate in the shaft for the discharge of the smoke. Flues thus charged with heated air, and prevented from escaping at the chimney-top, gradually lose their heat in the house through the bricks of which the flues are composed, and when once the whole volume of air in the house is heated to the required degree, this gradual supply from the flues will keep up the required temperature for a long time. If the doors of furnaces were made double, they would have the advantage of durability, and of preserving the heat from escaping behind, and of not so readily admitting cold air to pass over the fire, which air, of course, will be less heated, and less fit for entering into the flues, than if it entered below and passed through the body of fire in the furnace. Ash-pit doors are of *great* use, in consequence of their acting as regulators to the current of air for keeping the fire alive, or as a damper or suffocater, when it is judged necessary to extinguish or diminish the fire.

In fixing the situation of the furnace, much may be gained in point of economy in fuel, by placing them under the wall of

the house, or even partly within it under the floor, instead of building it some feet behind the house, where much of the heat must of course be lost, both in the thickness of the building that surrounds the furnace, and a great part will evaporate into the sheds behind, and be entirely lost to the house. This might be dangerous if large furnaces were used; but the superiority of small ones is now sufficiently proved, that few are built of that size, that are at all likely to be attended with danger from bursting. Indeed, it is now fully acknowledged, that it is better to have two, or even three separate furnaces to a large house, than one very large one.

We consider it as very important to have the grate or bottom of the furnace placed one foot at least below the level of the bottom of the flue, to create what is practically called a *draught*, or the circulation of the heated air and smoke, by allowing it to ascend a little immediately after leaving the furnace. The chief fault of badly *drawing* flues proceeds more from a want of this precaution than from any other cause we know of. It often happens, that if the furnaces be sunk to gain a sufficient draught, that water, from the nature of the situation, becomes troublesome; but this should be effectually remedied by having a sufficient drain laid to the bottom of the furnace, to keep it perfectly dry. Without this precaution, we have often known much inconvenience to arise. Whether the furnace be placed in a shed behind or not, it is necessary to have a space on each side of the furnace, for the purpose of holding fuel and the ashes, until they can be removed; or if they be daily carried off, which is the better way, one space should be used for coal, the other for cinders, so that the operator can mix them in such proportions as the state of the fires may require. These spaces on each side of the furnace may be arched and covered over (if not in the back sheds), and the remaining space opposite the furnace, which is generally used as the means of descending to it, may be provided with a door to shut down, when the fires are not used, so as to give a neat and orderly appearance to the whole.

Where the appearance of small sheds is not objectionable, should they not be required for any other purpose, they will be found necessary appendages over each furnace, both for the

comfort of those who have the attending of the fires, as well as to prevent the fires from being affected by the wind or state of the weather.

Each furnace, if at any distance from the others, should be furnished with an iron shovel and hoe, for the feeding of the fire, as well as to clear the neck from any cinders or ashes that may accumulate there, which, if not removed, would prevent the free burning of the fuel.

FUEL.

Fuel of different kinds has been used for heating hot-houses, but none are found to answer the purpose better than coal, or coal and cinders mixed. Those coals which produce the least smoke are to be preferred, and the smaller they are, the better. Wood has been often used, where coals are expensive, but from its combustible nature, it gives out its heat too rapidly, and soon burns out. Turf has been used in some places, but is also far inferior to coal. Cinders and turf are rather a better fuel, and have also been tried. Charcoal and coke are often recommended, and are of all other kinds of fuel the least accompanied with smoke.

Mr. Knight has recommended what he calls an economical fuel, and which he describes in one of his numerous papers in the Hort. Trans. as being composed "by making bricks of clay and coal-dust, in the proportion of one-third of its bulk of the former." With these, he says, he has been able to keep up a regular and high temperature at little trouble or expense, and calculates upon the ashes and burnt clay as being a valuable manure. It is not uncommon to see the peasantry in many places make balls in a somewhat similar manner, by mixing coal-dust and mud or cow-dung together. The best fuel, however, for this purpose, is the small of Newcastle coal, and this will be found the cheapest in most cases; however, coal and cinders mixed make very steady and lasting fires, and are most generally in use.

STEAM, AS APPLIED IN THE HEATING OF FORCING-HOUSES.

It is only very recently that any information has transpired on the subject of steam, applied to the heating of hot-houses,

in any channel likely to meet the eye of the practical gardener; the horticultural writers have hitherto only slightly mentioned the circumstance, without entering into detail. From that valuable publication, the 'Encyclopedia of Gardening,' we extract the following: "Steam affords the most simple and effectual mode of heating hot-houses, and, indeed, large bodies of air in every description of chamber, for no other fluid is found so convenient a carrier of heat. The heat given out by vapour differs in nothing from that given out by smoke, though an idea to the contrary prevails amongst gardeners, from the circumstance of some foul air escaping into the house from the flues, especially if these be overheated or over-watered, and from some vapour issuing from the steam tubes, when they are not perfectly secure at the joints. Hence flues are said to produce a burnt or drying heat, and steam tubes a moist and genial heat, and in a popular sense, this is correct for the reasons stated. It is not, however, the genial nature of steam-heat which is its chief recommendation for plant habitations, but the equality of its distribution, and the distance to which it may be carried. Steam can never heat the tubes, even close to the boiler, above 212° ; and it will heat them to the same degree, or nearly so, at the distance of one thousand, or two thousand, or any indefinite number of feet. Hence results the convenience of heating any range or assemblage of hot-houses, however great, from one boiler, and the lessened risk of over or insufficient heating, at whatever distance the house may be from the fire-place. The secondary advantages of heating by steam are, the saving of fuel and labour, and the neatness and compactness of the whole apparatus. Instead of a gardener having to attend to a dozen or more fires, he has only to attend to one; instead of ashes and coal, and other unsightly objects, at a dozen or more places in the garden, they are limited to one place; and instead of twelve pottery chimney-tops, there is only one, which being necessarily large and high, it may be finished as a pillar, so as to have the effect of an ornamental object. Instead of having twelve vomiters of smoke and flakes of soot, the smoke may be burned, by using Parke's, or some other smoke-consuming furnace. The steam tubes occupy much less space in the house than flues, and re-

quire no cleaning; they may often pass under the paths, where flues would extend too deeply. There is no danger of steam not drawing or circulating freely, as is often the case with flues, and always when they are too narrow, or too wide, or do not ascend from the furnace to the chimney. Steam is impelled from the boiler, and will proceed with equal rapidity along small tubes or large ones, descending or ascending. Finally, with steam, insects may be effectually kept under in hot-houses with the greatest ease, by merely keeping the atmosphere of the house charged with vapour from the tubes for several hours at a time. The boilers used to generate steam are formed of cast or wrought iron, or copper, and of different shapes. Wrought-iron, and an oblong shape, are generally preferred at present, and the smoke-consuming furnace most approved is that of Parke's.

“The tubes used for conveying steam are formed of the same metal as the boilers, but cast-iron is now generally used. Earthen or stone-ware tubes have been tried, but it is extremely difficult to prevent the steam from escaping at their junctions. The tubes are laid along or round the house or chamber to be heated, much in the same manner as flues, only less importance is attached to having the first course from the boiler towards the coldest parts of the house, because the steam-tube is equally heated throughout all its length. As steam circulates with greater rapidity, and conveys more heat in proportion to its bulk, than smoke or heated air, steam-pipes are, consequently, of much less capacity than smoke-flues, and generally from three to six inches in diameter, inside measure. Where extensive ranges are to be heated by steam, the pipes consist of two sorts, mains or leaders for supply, and common tubes for consumption or condensation. Contrary to what holds good in circulating water or air, the mains may be of a much less diameter than the consumption pipes, for the motion of the steam is as the pressure; and, as the greater the motion, the less the condensation, a pipe of one inch bore makes a better main, than one of any larger dimension. This is an important point in regard to appearance, as well as economy. In order to produce a large mass of heated matter, M'Phail and others have purposed to place them in flues,

where such exist. They might also be laid in cellular flues, built as cellular walls. The most complete mode, however, is to have three parallel ranges of steam-pipes of small diameter, communicating laterally by cocks. Then, when the smallest degree of heat is wanted, let the steam circulate through one range of pipes only; when a greater is required, open the cocks, which communicate with the second range; and, when the utmost degree is wanted, let all the three ranges be filled with steam." This plan has been adopted by Messrs. Loddige, at Hackney, and is, we believe, chiefly the arrangement of Mr. G. Loddige.

As a means of heating upon an extensive scale, we perfectly agree with the most strenuous advocates for steam, as being the most convenient carrier of heat, as well as of its equality of distribution. We are also confident, that nothing injurious to the most tender parts of vegetation ever proceeds from steam, and that fruits and plants may be grown or cultivated in houses heated by steam, as well as in those heated by any other means, provided the general management be equally good in every other respect.

But, that steam is the most simple method of heating hot-houses, or that it is more economical, either in point of fuel or erection, we are far from being singular in discrediting; neither do we think that there is any saving in labour. If ashes and coals be distributed to ten or twelve different furnaces, they are generally placed in such places that the delicate eye seldom visits; few, we believe, excepting the operatives, visit the back sheds of their gardens, where such unsightly objects are to be met with; but we have seen such places kept as clean and neat as the interior of many hot-houses often are. We think the necessary care and attention, on the part of the gardener, as much required in attending the boiler and steam apparatus, as in attending to any number of fires necessary to heat an equal space, provided the furnaces and flues be properly constructed. The chimney-tops objected to (although not always the case) often are and might easily be made ornamental, as vases, &c., rather than otherwise; and if any degree of taste be exercised in their formation and distribution, they become ornamental, taking off that

uniformity and stiff unbroken line, which the top of a garden-wall always presents, unless purposely broken. Arranged in such a way, they will be less offensive to the eye than a vast shaft, towering above every other object, and disgorging a volume of smoke, not much in unison with garden-scenery. Steam-pipes certainly occupy much less space in the houses than smoke-flues, which is always desirable; neither do they require any internal cleaning, which brick flues do; but they require the inspection of an engineer, or person of skill, to examine them once or twice a year; which is much more than the expense of a laborer or bricklayer cleaning the smoke-flues.

That insects are effectually kept under in houses heated by steam is not the case, it is done by good management only. Many who have had them erected have actually pulled them down and re-introduced the common flues and furnaces; and a strong proof, that they are more expensive is evident, from such eminent gardeners as Lee and Colvil, and many others, who have the most extensive ranges of houses round London, not having introduced steam. To such men as those, economy is an object, and to such practical men we are to look to for precedent, and not to gentlemen, who from motives of persuasion or scientific curiosity, adopt such projects. An eminent London nurseryman, who had his houses heated by steam at a great expense, has pulled the whole down, and substituted flues upon the general principle, but improved by his own ingenuity. He calculates a saving both of fuel and labor, taking the loss of the expense of his steam apparatus into account. Another instance of a person, long eminent for the cultivation of fruits in the neighbourhood of London, has pulled his down also, and re-introduced the original flues, being practically convinced that he has lost much by the experiment; and since the introduction of the hot-water system, heating by steam, in this country at least, may be said to be abandoned, as far as regards horticultural purposes.

It does not appear that hot-houses will ever be built in this country upon so extensive a scale, as to render the heating by steam really necessary, as a motive of economy. Where expense is no consideration, steam may be introduced into

large conservatories, and be converted to many other purposes connected with domestic economy, as such buildings are usually attached to, or near the dwelling of the owner; but for hot-houses in gardens, where the extent is not infinitely greater than any that has yet appeared in this country, fire-flues, or the hot-water system, will be found much the cheapest, and will answer every purpose of heating the houses equally well.

ON HOT WATER, AS APPLIED TO HEATING HOT-HOUSES, &c.

For the invention, and introduction into practice, of this really useful and ingenious mode of heating forcing-houses, we are indebted to the ingenuity and perseverance of William Atkinson, Esq., of Grove End, St. John's Wood, a gentleman, not only eminent in his profession as an architect, but also a zealous promoter of every thing connected with horticultural affairs.

For many years Mr. Atkinson has paid much attention to the amendment of horticultural architecture, and the improvements which he has made in that department reflect the greatest credit on his talents, both as a man of science and a horticulturist. To him we are indebted for many improvements in the construction of vineries and peach-houses for general purposes, and the application of heat, by means of properly-constructed furnaces and flues.

Mr. Atkinson is not a speculative adviser upon theory only, but he possesses a considerable practical knowledge of the management of hot-houses, having reduced to practice many interesting experiments in his private garden at Grove End. Many years ago, while engaged in making experiments upon the principles of heat, it struck him that water heated was a conductor capable of being turned to account, both for the purpose of heating forcing-houses, as well as for those destined for the habitations of man.

This idea, in the multiplicity of business, had been nearly overlooked or forgotten; however, happily, his mind became again engaged in the theory, and in 1822 he had a number of models made of different constructions, and by them he proved the practicability of the theory. These models were made

so as to apply to every position that it is possible for smoke-flues or steam-pipes to be applied to.

At this time, the heating, by means of hot water, was as much understood by that gentleman, and a few of his friends, to whom he explained its principles, as it is at this moment; and, as far as regards the heating of forcing-houses, he had nearly reached the climax of perfection. It would be useless to enter upon a point of controversy, as to the original inventor of this useful mode of heating hot-houses, while we are well assured, that the idea not only originated, but was brought to its present state of perfection, by that gentleman. It may be necessary, however, to state a few simple facts, which it is hoped will set this matter in its true light.

About the time Mr. Atkinson was making his experiments, a somewhat similar idea occurred to the late Anthony Bacon, Esq., and was tried by him in his houses, but without success. We have seen Mr. Bacon's original model, but, from its principle, it was incapable of carrying heat to any useful distance; and not until Mr. Atkinson directed the arrangement of the boiler and pipes, did it ever answer the desired end, in Mr. Bacon's houses. An account of its success in the Elcote gardens was published in the Transactions of the Horticultural Society, as well as in a provincial newspaper, by Mr. Whale, Mr. Bacon's gardener, as the plan of his late employer.

It would, however, have been only candid, had Mr. Whale, if he were aware of it, given in these communications the merit of the invention to the gentleman with whom it first originated. We will not attribute this step, on the part of Mr. Whale, to a wilful wish to mislead, or to bestow the merits of so useful an invention upon one who had only a minor share in it, and that share, however creditable to him, as an experimentalist, was not sufficiently perfected so as to answer the desired end. The death of Mr. Bacon following soon after the plan was brought to bear, prevents us from having his disavowal of the system as it now acts. Mr. Bacon certainly attempted a mode of heating by means of hot water, but had no idea of it in any other way than merely by heating the end of a tube filled with water, and by which he attempted to heat his houses, without the knowledge of the absolute

necessity of a circulation. So far Mr. Bacon had a share in the introduction of this useful plan, that he readily entered into the merits of the hot-water system, and has the credit of being the first in whose garden it was put into practice.

Mr. Atkinson had proposed the heating by hot water to one or two of his friends, for whom he was building hot-houses at the time, but they considered the thing as speculative, and declined it. He, moreover, offered to heat one of the houses of a certain public garden by the same means, but the cautious managers declined running any risk. They have, however, since adopted the very same plan, which they should, out of justice to their respectable fellow-member, the inventor, have been the first to accede to.

It has been stated, that a circulation is capable of being carried on in one pipe, upon the supposition that the hottest portion of the water will flow along the upper part of the tube, while the colder portion will return below it to the boiler; but this has not been found to act in practice.

By means of one pipe, water may be made the vehicle of heating to a certain degree, but only by having the tops of both the boiler and reservoir closely fixed down, and constituting, in fact, a vessel in one piece; the boiler and reservoir being connected by their being elongated in form by the connecting tube.

Boilers with fixed tops depart from the simplicity of the original mode, and in themselves are objectionable, inasmuch as they have to be taken to pieces to have the deficiency of water made up, which is lost; and the difficulty of getting them cleaned, which is a point, if not attended to, that would soon end in their bottoms being burnt out, by the sediment of the water, however pure, forming an incrustation upon the inner side of the bottom, by which the water is prevented from touching it; and, at the same time, the fire acting upon the opposite side, without the counteracting effects of the water within, soon burns them out.

Add to this, should steam at any time generate within, the consequence may lead to accidents of a serious nature. All horticultural machinery should be constructed upon the least complicated plan possible. It would be a libel upon the intel-

ligence of gardeners in general, to suppose them ignorant of the management of steam, in whatever way it may be applied for horticultural purposes; but it is not to be supposed that a gardener, who has many other things to think of, can sit all night and watch the progress of a steam apparatus; and few gardeners, generally speaking, have men of that talent allowed them who understand it; nor can the majority of garden-labourers be depended upon, either in regard to rewards or punishment, to attend to these matters.

Steam, for these and other more important reasons, is fast giving way to the hot-water system; and it is gratifying to see so many of those who were amongst the first to adopt steam, being amongst the first also to adopt the hot-water system, being now sensibly convinced of its superiority.

Seeing steam is abandoned, in consequence of the exorbitant expense of the first erection, the annual expense of keeping in repair, and the derangements to which it is liable, it is surprising that so many are not satisfied with the hot-water system, in its simplest state, when it is already sufficiently proved to answer every purpose expected, at least as applied to the heating of hot-houses.

Soon after smoke-flues began to be built upon scientific principles, improvements upon them sprung up, under the denomination of hot-air flues and cold-air flues, hot-air chambers surrounding the furnace, &c., all of which were found to be of no real use, but rather the reverse; and they possess no other merit than that of making the whole more complicated and useless. It would be well, therefore, of those who have the erection of the hot-water system, to bear this in mind; and while they improve, which we sincerely hope they will, that they will also keep the whole upon as simple a principle as possible.

In its original state, hot-water pipes cannot get out of order; but, by rendering them more complicated, the chances of derangement will increase. The more simple the construction, while, at the same time, durability, neatness, and sufficient power, are kept in view, the nearer to perfection will our attempts become.

The principal merits of the hot-water mode of heating

forcing-houses, over that of every other method hitherto used, are many, and have been already decided. The important object of an almost equal distribution of heat into every part of the house, is attained, which has long been a desideratum, and which none before have accomplished. The water in the pipes, or reservoir, at the extremity of a house sixty feet long, is found to be within a few degrees of that in the boiler; thus giving a very equal temperature into all parts of the house.

The body of water, once heated in the boiler, pipes, and reservoir, is long in giving out all its particles of heat to the atmosphere of the house, even after the fire has long ceased to burn. Thus the person who has the charge of the fires may safely go to bed at nine o'clock, and by seven next morning find his house at nearly the same temperature in which he left it. This can never be relied upon when smoke-flues are used. The more capacious the boiler, pipes, and reservoir are, the longer will they continue to give out their heat.

The heat given out by hot water is free from all sulphureous and noxious gasses, which smoke-flues, however well constructed, or however good the fuel may be that is used, are evidently charged with, and which escape through the joints of the flues. It is really surprising, that we have been able to cultivate plants and fruits, natives of tropical countries, and of exquisite beauty and flavor, in an atmosphere so bad as that of our plant-stoves and forcing-houses, in the manner they have been hitherto heated.

That there is a very material saving in the expense of fuel, a very important consideration, and the principal cause that has prevented the more general erection of hot-houses in this country, is allowed by every one that has tried the hot-water mode of heating.

The expense of the first erection is somewhat more than brick-flues, and infinitely less than steam. The durability is much longer than that of either. The annual expense none; for, if once properly erected, it will last for years, and requires no cleaning nor repairs.

The materials used are cast-iron, for the boiler, pipes, and reservoir; and probably no substitute will be found to answer better. In most cases, the pipes hitherto used have been

such as are used for conveying water through the metropolis ; but, as the demand increases, pipes will be manufactured for the purpose, and will consequently be improved. Thus the clumsy flanger-joint will give place to a neat socket-joint, or probably a better may be devised, and the pipes may be cast in longer pieces, and thus require fewer of them. Some have used boilers of various dimensions and forms, and have used pipes of tin, earthenware, &c., which, if properly laid down, answer perfectly well, but of course are much less durable. The figure of both boiler and reservoir may be the same or not, and may be of any shape to suit circumstances ; but that of a square-sided figure will be found in most cases the best, as affording greater facility in joining them to the pipes. The size of both boiler, pipes, and reservoir, should be in proportion to the size of the house and the temperature required. It is ascertained that a small boiler will heat a considerable-sized house ; but as the additional expense of a larger one is not material, it will be better to have them in the first instance sufficiently large. The form of the pipes hitherto used, has, for the most part, been round ; but it is thought that square ones, or shallow broad ones will answer better. Stone reservoirs have been recommended, and even stone pipes, but in most cases, these would be more expensive than iron ones, besides the difficulty of making them water-proof at the joints, as well as of procuring stone that would not admit of the escape of the water either by absorption or filtration.

The situation in which the boiler or reservoir should be placed, will depend entirely upon circumstances. In all cases, both should be placed within the house, as by that means no heat will be lost. The boiler may be placed in a recess in, or in front of the back wall, either at the ends or middle of a house, or between two houses ; the fire to be got at from the back sheds ; or it may be placed in the front of the house, either in the middle or ends, as above. When the house is of great length, the boiler being placed in the middle, the pipes may branch from it to the right hand and also to the left, and so extend to the ends of the house, and join to a reservoir ; from which the returning pipe, being placed below

the other, will convey the water back to the boiler to be again heated. When the degree of heat required is considerable, two upper pipes, or even three may be used, or they may be of greater size, presenting, in either case, as much surface as possible.

A green-house of two hundred feet in length, may be sufficiently heated in this manner with one fire; the boiler being placed in the middle under the stage, or in a niche in the back wall, and the pipes extending to right and left. In all cases, where it can be attained, the pipes should run parallel, and as near to the front wall or lowest part of the house as possible. The heat will always find its way to the highest parts; or, where houses are of less length, and connected, the boiler may be placed between two, and either one or both may be forced at the same time, with the same fire. In pine-stoves and pits, where most heat is required, two or three pipes are used to convey the heated water to the extremity; and this water is brought back to the boiler by one single pipe, having a slight inclination from the farthest end towards the boiler.

The hot-water system, applied in the frame or pit-ground, for the cultivation of young pines, early melons, cucumbers, forcing flowers, sea-kale, asparagus, &c., or for the protection of green-house plants, bids fair to give a new feature to that department; and we hope, through its adoption, to see the melon-ground soon a spot of some order and interest, instead of a dung-yard of the worst description, which it is at present. A very considerable length of pit-forcing might be carried on by hot water, and a temperature kept up, not only with regularity, but with little expense. The uncertainty of dung-heat, together with the expense of management and evident waste of manure, and the constant litter in which it keeps this department, will be got rid of, by substituting hot water. Fire-heat, by means of flues, can never be generally nor safely applied to pits or frames of ordinary dimensions, the flues occupying too much space, and the heat obtained being so unequally distributed, one end being burnt, while the other is freezing. This is not the case with hot water; the heat being uniform for any reasonable length, and the space occupying only a few

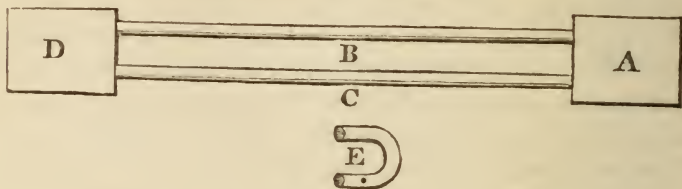
inches. Four pits, each one hundred feet in length, and placed in two ranges parallel to each other, the back range being elevated, so that the front one should not shade it, which might be readily done by forming the ground upon which they are built as an inclined plane, one boiler placed in the middle between them, and having a course of pipes entering each pit from the boiler, and each making a circuit of a pit, and returning again to the boiler; or one pipe, of a larger diameter, might enter at the front of each of the two back pits, and extend to the farthest end, where they might make an elbow turn, or discharge into a reservoir, which, containing a body of heated water, would increase the temperature sufficiently for most purposes, and return by another, immediately below it, to the boiler. The others to enter at the back of the front range of pits, and make the same revolution as the others.

Thus, by one fire, four hundred feet of pits, averaging six feet in width, might be brought into use at little expense or trouble; and in them, a gardener of moderate attainments might produce a competent share of all the vegetable luxuries, that are to be met with, or wished for, at the tables of the great. These pits should be in divisions of three or four lights each; and such as are most remote from the boiler, should be occupied with radishes, salads of all sorts, sea-kale, asparagus, and such things as require the least degree of heat; and next to them should stand forced flowers, strawberries, young pine plants, &c.; and nearest to the boiler should be grown French beans, melons, cucumbers, &c. For a greater command of heat, the pipes may be larger next the boiler, or two pipes may be used, and afterwards united into one, at a certain distance; from which a sufficient degree of heat would be given for any vegetable that is cultivated in these structures. In such cases, the boiler should be enclosed in a separate space, covered over with a boarded top, instead of a glass one, which would be less liable to be broken; and, by being a non-conductor of heat, would therefore more readily prevent its escape.

The smoke might easily be made to pass off, so as not to affect the plants in the pits; and the whole pit-ground might

be laid out with some share of taste, and so be an additional ornament, at once pleasing and useful.

The following will explain the principle upon which it acts: A is a boiler, to which the cast-iron pipe B is joined, and which is four inches in diameter; the uppermost of which B proceeds horizontally from the top of the boiler A, towards



the opposite side, or end of the house, where it is joined to the reservoir at D, or it may make a turn at an elbow, as at E; this depends upon the size of the house. If large, the reservoir D, containing a large body of heated water, gives an increase of heat at the coldest end of the house, and renders the temperature there equal almost to that at the end next the boiler. C is a returning-pipe from the bottom of the reservoir D to the bottom of the boiler A. The boiler is set in brick-work, in the usual manner. As soon as the fire is lighted, and the water begins to heat at the bottom of the boiler, the particles of warm water, being lighter than those that are cold, ascend to the surface of the boiler, and gradually flow horizontally along the pipe B to the reservoir D; and the cold water in the reservoir, being heavier than that which is warm, gradually flows along the pipe C to the bottom of the boiler. As long as any heat remains in the brick-work round the boiler, this circulation is kept up. It is found in practice, that it is essentially necessary to have two pipes employed, one from the top and one from the bottom of the boiler, connected at the end, either by a reservoir, as at D, or by an elbow-pipe, as at E, to keep up this circulation. The boiler is furnished with a wooden cover, and the reservoir with an iron one: the former is preferred, as the water in the boiler will always be rather warmer than that in the reservoir; the wooden cover being a better non-conductor of heat than the

iron one over the reservoir, and is used to regulate the temperature of the house.

The section of a vinery heated by hot water will give a pretty good idea of the principle upon which it acts: (*a*) is a boiler two feet and a half long, eighteen inches wide, and twenty inches deep, and placed in a niche in the back wall of the house; from the end of the boiler proceed horizontally three cast-iron pipes, of four inches diameter; two of them are joined to the boiler near the top, and proceed upon a level to the front of the house, and along the front to the farthest end, where they empty themselves into a reservoir, or make a turn by an elbow-joint in the pipe, as circumstances may direct. In either case, the water is conveyed back again to the boiler by a single pipe, which is placed directly under the two upper ones, and enters the boiler near its bottom. The fire is fed and managed from behind, in the usual manner, in the back sheds (*b*).—*See Plate.*

VENTILATORS.

Hot-houses built with fixed roofs require a different mode of ventilating, than those which have the roof-sashes made moveable; all curvilinear houses, without incurring a great expense, belong to this class. The most approved method of ventilating houses of that description, are by having apertures formed in the front, or parapet wall, under each sash, of sizes differing according to the magnitude of the house, or the purposes for which such house is intended. These apertures are furnished with wooden doors or lids, which are opened more or less, and shut at pleasure, either individually or all at the same time, by means of a sympathetic movement. The top part of the back wall is also furnished with corresponding apertures for the escape of heated or foul air, and are either made to pass directly through the wall, or to turn upwards through the coping, and are, in either case, also opened and shut up by the same means. According to this plan, a body of fresh air is constantly passing into the house from the front ventilators, during the time they are open; while from the top

ones the heated air, being more light, readily escapes, and the space emptied by such air escaping is immediately filled with fresh air from below, which circulates through the house, until it becomes sufficiently heated to find its way out. This important improvement in the necessary change of air in hot-houses was first brought into notice by W. Atkinson, Esq., and has been employed, with every success, in the numerous hot-houses built under the direction of that gentleman. The cold air passing into houses in this manner, having to pass over the flue immediately upon entering the house, becomes moderated in temperature, so that it cannot possibly injure the most delicate bud or flower; while the methods formerly in use possessed this defect, that the necessary fresh air, however cold it might be, was let in close upon the trees by opening the sashes, and while the tree was warm within. Thus a number of currents of cold air were in an instant let in upon them, which could not but prove of much injury to them in their more tender state. Nothing is so injurious to vegetables, as well as to animals, as sudden transitions from excessive heat to excessive cold. For early forcing, this mode of ventilating is decidedly the best, and all houses, whether for early or late crops, should be provided with such ventilators, thereby affording the means of giving air in cold or wet weather, when it could not be with safety admitted by the roof-sashes.

FOOTPATHS.

Footpaths have hitherto most generally been composed of mere planks, laid upon the borders to walk on; in other cases, lattice-work has been adopted, supported on blocks of wood, in order to admit the sun and air to the border below, and to prevent its being much trodden on by walking. Neat wooden footpaths, painted and elevated two or three inches above the border, are not objectionable; but the neatest and most permanent are constructed of cast-iron plates, made to rest upon props, at a proper height from the ground. These cast-iron gratings can be made to any pattern, and of lengths convenient

for their being removed, and placed down again at pleasure. These gratings are well adapted where the path passes along above the flue, as they not only prevent the covers from being broken, but also allow the free escape of the heat. Such gratings have been adopted in the forcing-houses at Sion-house, and have a very good effect. Their expense is not more than that of neat well-made wooden footpaths, with this advantage, that they look much neater, and will last ten times as long.

GLAZING AND PAINTING.

It is necessary that all hot-houses should be glazed with the best crown glass, as admitting a greater share of light to the plants contained therein, and not with glass of an inferior quality, as was long the practice. Formerly less attention was paid to this important point, and on the continent, to this day, many extensive ranges of hot-houses are glazed with glass of a very inferior quality. It appears, by the experiments of Bouguer, that one-fortieth part of the light, which falls perpendicularly on the purest crystal, is reflected off, nor does it pass through it; it may be safely asserted, that green glass reflects off more than three-fourths. There is nothing gained by using bad glass in the glazing of hot-houses, but evidently much is lost.

Various shapes have been recommended for the panes, or pieces of glass, for which purpose the most reasonable is that of the rectangular or curvilinear; but for hot-bed frames, the fragment form may be used as cutting less to waste. The first of these is the original form, and is still the most frequently met with; the second looks neater, and has this advantage, that it aids in conducting the water which falls on the roof to run down in the centre of the pane, by which means, it is less likely to get into the house, between the glass and the bars.

In either case, it is of importance that the glass be cut exactly to fit the space, which it is intended to cover, not being put in too tightly, which renders it more apt to be broken

by any shaking of the sash; nor yet too narrow, which would admit the water to enter into the house; and that it be well bedded in good old putty, so as to lie solid, and therefore sustain a greater pressure. A great fault in the glazing of hot-houses is allowing too much overlap, that is, one pane projecting over the other too much; and it is difficult to get tradesmen to attend to this very important point. The broader the lap is, the more liable is the glass to be broken, as it contains a greater body of water, conveyed into it by capillary attraction; and when such water becomes frozen, the expansion is so great, as not only to break the glass, but it soon fills up with earthy matter, forming an opaque space, which are both injurious, by excluding a large portion of light, and also disagreeable to the sight. The accidental filling up of such spaces with filth, probably first gave the idea of filling the laps up with putty of various colors, principally black, and was an important improvement in hot-house glazing; soon after followed the adoption of narrower laps, either puttied or left open.

Laps of less than a quarter of an inch, in either rectangular or curvilinear formed panes, may be puttied without having a bad effect, and will materially aid in preventing the glass from being broken. The expansion of water by frost, which lodges between the laps, breaks more glass than any other natural cause whatever. This mode of closing the lap, either for the exclusion of cold or wet, is more durable, and less troublesome in repairing, than any other. The smaller the laps are, so that they cover the joint perfectly, the neater will they look, and the less liable will they be to be broken.

Putty of the best quality should only be used for hot-house glazing, and that called *soft putty*, being formed of well wrought paste of flour of whitening and raw linseed oil, is the best and most durable, because it forms an oleaginous coat on the surface, and requires longer time to dry. Other sorts have been used and recommended, but the difficulty of getting it out in repairing is so difficult that it is found advisable to use only the *soft putty*. Of the various forms of glazing, may be mentioned the following: the rectangular; the frag-

ment; the perforated shield; the entire shield; the rhomboidal; the curvilinear lap; the reversed curvilinear, &c.

A strict attention to painting the houses in some regular order, or at stated times, has not been sufficiently attended to. The expense is certainly considerable; but, in the end, a strict attention to this particular will be found a great saving. Paints of the best quality should be used, and, as light is the object in view, white of all colors is to be preferred, or next to that, light stone color. In painting newly erected houses, they should not be considered as finished with less than three good coats, and should be painted every second or third year, with one coat on the outside, and for the inside, once in four or five years will be sufficient.

TRELLISING.

Trellising is now universally made of wire, as being lighter, stronger, and more durable than wood, and capable of being put up at much less expense. The distance at which wires should be placed from each other, as well as from the walls, or glass, depends upon the trees intended to be trained upon them. For grapes, a foot from the glass, and fourteen inches apart, will be found sufficient; for peaches, nectarines, cherries, or plums, one foot from the glass, and nine or ten inches apart from each other. Grapes trained up the rafters of pine-stoves, &c. should be one foot from the rafter, and to form a triangular trellis, composed of three courses of wire, to which they should be secured. Vines are sometimes trained up the rafters of green-houses, in the same manner. The trellises should be so arranged as to afford the greatest possible surface for training upon, without creating confusion or shade. Vines are most generally trained up the roof, covering the whole surface, at a distance sufficiently secure to prevent the foliage from being scorched, yet near enough for the wood and fruit to enjoy as much sunshine as possible. In metallic houses, the distance from the glass should be greater than in wooden ones. Peaches, nectarines, &c. are sometimes trained in the same manner as vines, but they are more generally trained to the

back wall, having a curved trellis in front, extending from the front parapet to within a sufficient distance of the back wall to admit of a walk of sufficient breadth. This curve is more or less, according to circumstances, but should be kept as high as possible, so as to enjoy as much benefit from the glass as can be obtained, but still not so much as to shade in any degree the back wall. In houses of ordinary dimensions, trellises constructed in this manner will admit of a great surface for training upon. We have constructed with success perpendicular gable trellises, exactly placed under every alternate rafter in houses trellised as above, and never failed of having very good fruit in all parts of the house. This we consider is giving the greatest possible extent of trellis that can be introduced into any house. It has been asserted, that such perpendicular trellises shade the other parts of the house; but this is not the case, if due attention be paid to training in the shoots, as they advance in a regular manner to the trellis; a practice which should be attended to upon every trellis; and so convinced are we of the propriety of such a mode of training, that were we to construct peach-houses to any extent, the larger part should be trellised in this manner. In houses for very early forcing, the back wall only is trellised, such houses being very justly constructed on a narrow scale, and training too near the glass in them, might be attended with accidents.

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VOL. II.

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MONTHLY OPERATIONS

OF THE

FORCING GARDEN.

JANUARY.

PINES.

ALL those cultivators who have attained the greatest celebrity in the cultivation of this fruit agree in the necessity of having three distinct divisions, or compartments, suited to the different stages of their growth. One for crowns and suckers; one for those in their second stage of growth, generally termed succession-plants; and a third for the plants when fully established, and in which they are to perfect their fruit.

The necessity of these separate pits, or divisions, is proved by the plants requiring different modes of treatment during their growth, particularly as regards temperature.

Climates in which the pine is indigenous, have not this variety of temperature, it not being necessary in nature. The growth of the plant from the seed, suckers, or crowns, proceeds at all times of the year as they may happen to be stuck into the ground. This slovenly mode of culture never brings this incomparable fruit to that state of perfection, which we often see it in the pine-stoves of this country; and even here we have it in higher perfection and flavor, than it is ever found in a cultivated state within the tropics.

Although the pine is a native of warm climates, it is not so tender as many imagine. They will bear a much higher degree of heat, for almost any length of time, than most fruit-bearing plants in cultivation, and will also, without injury, bear a degree of cold that would be death to any other exotic fruit, while in a state of vegetation. They are liable to be

attacked by insects, in all stages of their growth; the most annoying of which are the white turtle insect, (*Coccus Hesperidum*, Linn.) the white scaly insect, and the white mealy crimson-tinged insect, the last of which is the worst, as it attacks the plant from the top of the crown to the remotest parts of the root. Although difficult to clear of such enemies, still they will bear them, without sustaining much injury, longer than almost any culinary vegetable will withstand the attacks of the insects natural to them. Of natural diseases this plant has few, and we find it producing its fruit under a greater variety of bad culture, than almost any other cultivated fruit.

A variety of opinions have of late been entertained, whether this plant should be cultivated in a bottom heat, that is, whether the pots in which the plants are planted should be plunged into substances, either in a state of fermentation, or rendered more or less warm by means of fire-heat, steam, hot water, &c., or whether it should not be cultivated without such bottom heat, or at least only to a temperature approaching to that of the natural warmth of the soil, in which it grows in its native country. When first introduced into Europe, it was cultivated, as we might naturally suppose, without any such bottom heat; and the Dutch gardeners, who first attempted its cultivation, placed it upon stages with their other succulent exotics. Ingenuity, however, soon suggested, and experience approved, the advantage of plunging the pots in which the plants are planted in a mild bottom heat. Pines, however, do not require so strong a heat at their roots, as many keep them in, yet there is something so congenial to their natures, in being plunged in a moist mild temperature, that those, who have attempted their cultivation to any extent without it, have generally failed not only of producing fruit of any size or quality, but are unable to keep the plants in a healthy growing state. It is true that no plant is found in a state of nature growing in a soil warmer than that of the superincumbent atmosphere; but in cultivating many of our fruits and vegetables, we are not to imitate nature as the best mode of culture. If such were the practice, what would our asparagus, cabbage, and many other of our most valuable vegetables be? and if we were to grow our celery in ditches, should we be rewarded

with that highly useful and delicate salad in a state so good, as that where it is cultivated in the usual manner? Although pines will grow without bottom heat, still we have the experience of many years, and also of many intelligent cultivators, that they will grow in bottom heat much better; and although the heat of the soil in which the pine grows in its native country may never exceed, and seldom equals that of the surrounding atmosphere, yet it does not follow that earth heated to a greater degree may not be of service to it, in an artificial state of cultivation. Our indigenous plants, *Crambe Maritima*, sea-kale; and some others, are brought to the greatest perfection, by being cultivated in a temperature much higher, in proportion to their natures, than has ever been attempted with the pine. The conclusions drawn by an intelligent writer upon this subject are in exact correspondence with our own. "It appears from nature," says he, "as well as from observing what takes place in culture, that the want of a steady temperature and degree of moisture at the roots of plants, is more immediately and powerfully injurious to them than atmospheric changes. Earth especially, if rendered porous and sponge-like by culture, receives and gives out air and heat slowly; and while the temperature of the air of a country, or a hot-house, may vary twenty or thirty degrees in the course of twenty-four hours, the soil at the depth of two inches would hardly be found to have varied one degree. With respect to moisture, every cultivator knows that in a properly constituted and regularly pulverized soil, whatever quantity of rain may fall on the surface, the soil is never saturated with water, nor in times of great drought burnt up with heat. The porous texture of the soil and sub-soil being at once favorable for the escape of superfluous water, and adverse to its evaporation, by never becoming so much heated on the surface, or conducting the heat so far downwards as a close compact soil. These properties of the soil, relative to plants, can never be completely attained by growing plants in pots, and least of all by growing in pots surrounded with air. In this state, whatever may be the care of the gardener, a continual succession of changes of temperature will take place in the outside of the pot, and the compact material of which it

is composed being a much more rapid conductor of heat than porous earth, it will soon be communicated to the web of roots within. With respect to water, a plant in a pot surrounded by air is equally liable to injury. If the soil be properly constituted, and the pot properly drained, the water passes through the mass as soon as poured on it, and the soil at that moment may be said to be left in a state favorable to vegetation; but as the evaporation from the surface and sides of the pot, and the transpiration of the plant proceed, it becomes gradually less and less so, and if not soon re-supplied, would become dry and shrivelled, and either die from that cause, or be materially injured by the sudden and copious application of water. Thus the roots of a plant in a pot surrounded by air are liable to be alternately chilled and scorched by cold or heat, and deluged or dried by a superabundance or deficiency of water; and nothing but the perpetual care and attention of the gardener, to lessen the tendency to these extremes, could at all preserve the plant from destruction. To lessen the attention of the gardener, therefore to render the plants less dependent on his services, and, above all, to put a plant in a pot, as far as possible, on a footing with a plant in the unconfined soil, plunging the pot in a mass of earth, sand, dung, tan, or any such material, appears to us a most judicious part of culture, and one that never can be relinquished in fruit-bearing plants with impunity. Even if no heat were to be afforded by the mass in which the pots were plunged, still the preservation of a steady temperature, which would always equal the average temperature of the air of the house, and the retention, by the same means, of the steady degree of moisture, would, in our opinion, be a sufficient argument for plunging pots of vigorous growing or fruit-bearing plants."

Mr. Knight, in several papers in the Horticultural Transactions, has endeavoured to establish the practice of growing pines upon stages, and otherwise, without bottom heat; but in this practice he has not equalled, far less excelled, the most indifferent pine-grower in the country. Example is better than precept; and until Mr. Knight has proved by example his mode of culture to be superior to that so long approved of by practice, his converts must be few. However, this emi-

nent horticulturist deserves well of his country for any experiments he may make; he has made many, and some highly useful, and, much to his credit, he has performed them at his own expense, so that if he fail in some, it is but a natural consequence which falls to the lot of man. However, he has succeeded so far by his own confession, in one important object, namely, in initiating a novice, an ignoramus, or, to use his own words, an "extremely simple laborer, who does not know a letter or a figure, and who never saw a pine-plant growing till he saw those of which he has the care," to understand their culture as well as he does himself.

Attempts to cultivate pines, without bottom heat, have been tried by several gardeners, both on the continent and in this country, and have been abandoned without the least hope of success.

The necessity of a mild bottom heat being urged, we will now proceed to consider the most economical agent to produce that effect; as economy in the production of every article of horticultural produce should be the first consideration of the practical gardener, provided the result will be equally good with that of more extravagant methods.

Tan, or tanner's bark, has been longest and most universally used for forming a bed in which to plunge the pines in pots, and also to plant both crowns and suckers while still without roots. In using tan, it should be well sweated and frequently turned over previously to putting it into a new pit, so as to reduce it into a half-rotten state; and, in adding new bark at any time, in shifting the plants, or regulating the temperature of the bed, there should never be a great proportion added at one time, seldom above one-eighth of the whole. In putting in the new tan, it should be well kept down in the process of trenching and mixing the whole, and bringing up twelve or fifteen inches of the old tan to the surface in which to plunge the pots. When much of the old tan appears decayed and reduced to mould, it should be sifted, and the finer parts rejected and carried out of the house, and the coarser remains mixed along with the rest in the bed. To keep up a regular temperature, the beds will have to be stirred up, and fresh tan added, in such portions, and at such periods, as

may be thought necessary for the purposes required; and when peculiar circumstances require a speedy augmentation of heat, without displacing the pots, as when the fruit is to be swelled off in the last stage, at which time the roots of the plants will generally be extended into the bed, and would be seriously injured if disturbed, the more decayed tan at the top may be removed in part carefully, and a coat of new tan substituted: this is also often practised when the heat of the bed declines, and the state of the weather, or other circumstances, prevent a thorough turning over of the whole. When the tan gets too dry at any time, which it will be apt to do near the flues, water should be poured upon it occasionally between the pots, which will cause a fine moist heat to arise among the plants, which is always desirable in pine-stoves, and will likewise enable the tan to retain its heat longer than if it were suffered to become dry; for no vegetable matter will continue in a state of fermentation after the moisture has evaporated. Besides, it will prevent the chance of the dry tan igniting, which is sometimes the case near the flues, admitting that there should be a cavity or space between the bricks that compose the flues, and the tan-bed.

Tan should always be partially dried before put into the bed; and if kept in an open airy shed, for a week or more before using, so much the better. Heat thus produced will last, with very little trouble, from three to six months, when it is again put into fermentation, by adding a proportion of fresh tan, as stated above.

Where tan is difficult to be procured, and where oak and other tree-leaves are to be had in plenty, the bed may be composed chiefly of leaves, or a mixture of leaves and stable dung, using a little tan to surface the bed with, in which to plunge the pots. In using leaves of trees, either alone or mixed with dung, tan, or any other substitute, it is necessary that they be well fermented before they are carried into the pine-house or pit, that the rank heat may be so far extracted from them. They will, in this case, keep to a much more steady heat, and last much longer without renewing.

Leaves for this purpose should be chiefly composed of oak-leaves; for experience has taught us that they are more dur-

NOBLESS PEACH.

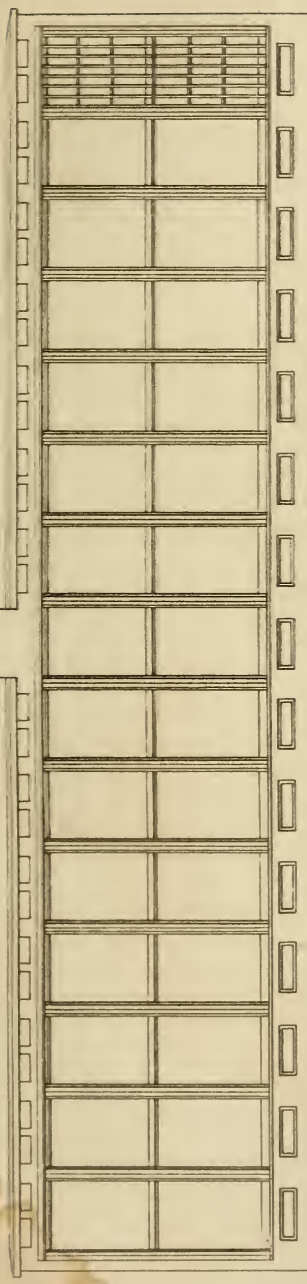


Painted by J. J. Audin,
for the Horticultural Society.

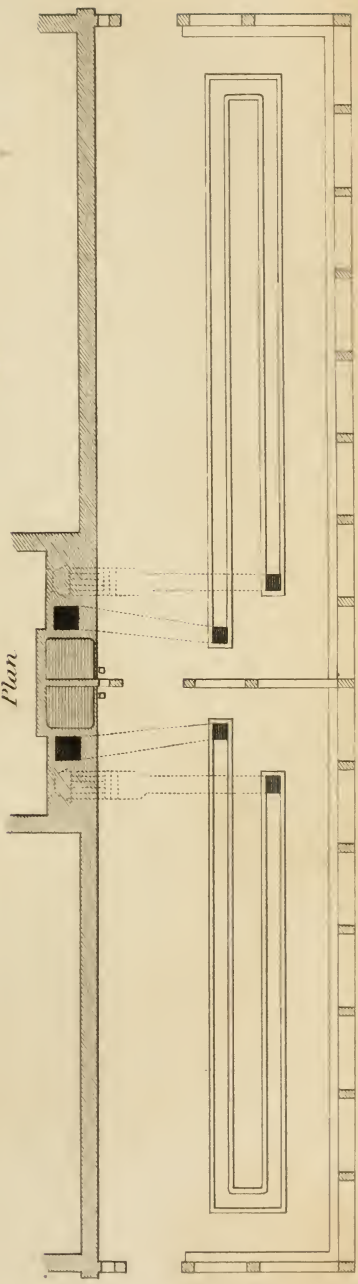
Cherry Hill

Front

Elevation



Plan





able in fermentation than any other; however, beech, horn-beam, and Spanish chestnut, are nearly as good. Those of ash, all sorts of fruit-trees, horse-chestnut, and lime should be rejected, if plenty of the others can be readily procured. They should be collected as soon as they fall from the trees in sufficient quantities, or as soon after as is practicable, and be gathered into large heaps in different parts of the woods; or, if there be convenience, they will be more handy, if brought at once to some place near to the forcing-houses or pits. There should be a neat inclosure formed, capable of containing a sufficient quantity for the season, open at top, and the sides secured with boards four or five inches broad, and three or four inches apart from each other, with a gate sufficiently large to allow a cart to go in and out, for the convenience of filling the place with leaves, as well as for taking them out, if wanted, to a greater distance than it would be deemed right to convey them by any other means. This will prevent them from being blown about over the garden, and will render the place neat and clean. They will here ferment, and be at all times ready for use; if they should be put in very dry, which often is the case, they should be watered for the purpose of commencing fermentation, and it may be found hereafter necessary to repeat this watering. It would be very useful to have another place of the same dimensions, and similarly constructed, in which to place dry leaves; if well trodden when put in, they would keep for many months, and be extremely useful in summer for many purposes, and in the autumn following, before the leaves fall off the trees.

In putting them into the pine-pits, if they be dry, they should be watered and well trodden, so that they will not sink too much afterwards. When the pits are full of leaves, the plants may be plunged in them in the usual manner, or there may be laid a few inches of tan upon the surface, upon which, when properly levelled, place the pine-pots, filling up the spaces between the rows of plants, as the process proceeds, closely with tan. Two wagon-loads of tan will be sufficient for a large house, and will last for this purpose a season. If tan cannot be procured, saw-dust may be used as a substitute, or plunge them in the more decomposed leaves, taken from

the bottom of the pit or bed. The pots, when plunged into the bed made of leaves alone, are apt to become loose, the leaves binding together in heating, and thus shrinking away from them, thereby exposing the roots to the air, and permitting the heat of the bed to escape; whereas, when plunged in tan, saw-dust, or similar substitutes, this evil is obviated.

The heat produced by oak, or other leaves, is uniform, mild, and lasting, and seldom endangers the roots of the plants with too much heat, which is an important object; and if the leaves be put in, in good condition, they will keep up a sufficient temperature in most cases for six months, and will not require to be turned over so often as tan, or any other substitute, to refresh the process of fermentation. This will save much trouble and expense, preventing also the necessity of exposing the plants to heat and cold, by moving them about from one place to another. The roots of the plants will also penetrate through the holes in the bottom of the pots, and extend themselves a considerable way into the bed of half-decayed leaves.

From the appearance of the roots of these plants, we might naturally suppose that the plants derive nourishment from the half-rotten leaves, and also from tan in a state of decomposition; although A. Young, Esq., in his *Essay on Manures*, says, that spent bark seems rather to injure than assist vegetation, which he attributes to the astringent matter it contains; but every cultivator of the pine must have observed with what seeming pleasure the roots of these plants penetrate into half-rotten tan, as well as into leaves in a similar state of decomposition; indeed, many excellent cultivators root their pine plants in rotten tan only. Oak-bark is certainly highly charged with astringent properties, but is freed from that property by the operation of water in the tan-pit; and if injurious to vegetation, the effect is probably owing to its agency upon water, or to its mechanical effects. Many of our more rare Alpine plants thrive in rotten tan, when they will live in no other preparation which we can make for them.

Where tan cannot be very readily obtained, oak or other leaves are equally good for the fermenting purposes in the pine-pits; and, indeed, where it is even to be conveniently procured, we would recommend a mixture of both, as affording an ex-

cellent temperature, more lasting, and more uniform in its effects.

Leaves, after being too much decayed to be of further use in the process of keeping up a sufficient temperature, are, of all other species of manures or moulds, the most useful and generally used in a garden; and, when reduced to vegetable mould, are experimentally known to be the most natural of all vegetable food. Scarcely any seed refuses to vegetate in it, and many of our choicest flowers prefer it to all others. It enters into almost all compositions for fruit-trees and fruit-bearing plants, and is a manure suited to all soils, and under all circumstances.

Speechly, during the time that he was gardener to the Duke of Portland, brought the use of oak-leaves into notice as a substitute for tan, and used them to a great extent. He goes so far as to say, that a bed of them will retain sufficient heat during twelve months without turning, or any further trouble, and that those which have been in use for a season will, by an addition of fresh leaves, continue their fermentation still longer. It must be allowed, that any material, capable of affording a sufficient degree of heat for these plants, without renewal, for one season or more, would be a desideratum to the horticulturist; for, besides the saving of labor and expense, which, in large collections of pines, are considerable, the plants would be much less liable to sustain injury or checks in the operations of turning or renewing the beds, to which they are constantly liable, however carefully the operations may be performed. We have never, in our practice, been able to secure so long a continuance of sufficient temperature in one bed, without a renewal or addition; but we have uniformly found the heat from leaves to be much more permanent and regular, than that from any other material. It is only for plants in their last stages of growth, that is, from the time that they are potted in the sized pots, in which they are to perfect their fruit, that their remaining undisturbed is of the most consequence to them. Previously to that period, they would have to be frequently removed out of the bed, for the purpose of being placed in larger pots, at periods depending upon their state of growth, &c. Beds of leaves, properly fermented and made will retain sufficient heat, in most cases, from the time

that the plants are plunged in them for the last time, that is, from the time that they are shifted into full-sized pots, until they ripen off their fruit; and the same quantity of leaves, without addition, will continue their heat during twelve months, if turned over twice or thrice a year, or at such times as may be most convenient, when the plants are taken out for re-potting.

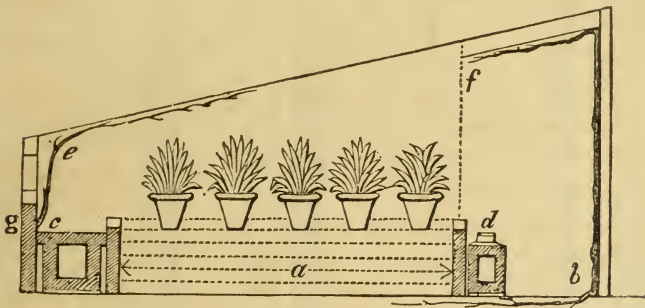
Pines are also successfully cultivated, without either tan or fire-heat, by means of dung only; for which purpose, beds are made of dung, after being properly prepared by fermenting and turning, and erected as is usually done for cucumbers, and a frame placed upon it similar to those used for growing that fruit, but of such dimensions as are suited to the size of the plants, whether they be nursing, succession, or fruiting. The pines are plunged in these beds as in the tan-beds, and managed accordingly. When the bottom heat declines, linings of hot dung are applied, in the usual way, to promote a continuance of heat; and when the whole mass becomes too much decayed, and too compact for the heat of the linings to penetrate freely, the plants are removed into others similarly prepared for their reception. By this simple means, pines have been grown equally well with those in expensive and lofty pine-stoves, and at a considerably less expense. Beds built of fagots, and covered with fifteen or eighteen inches of tan, leaves or saw-dust, and heated by means of external linings, answer equally well.

Dung-heat and fire-heat combined have been used by Mr. Jenkins of the Portman nursery, for several years. The heat imparted to the plants is by him produced from the fermentation of rank stable-dung, not at all prepared previously to using, in a vault below the plants; the top of which vault is covered with thin tiles, supported by means of iron-bearers. The joints of the tiles are closely cemented, to prevent the steam from getting into the house. The pots, in which the plants grow, stand upon the tiles without being plunged in either tan, or any other material; the heat penetrates through the tiles, and is found to warm the atmosphere of the house sufficiently for cultivating these plants. However well this plan has hitherto succeeded, there is no doubt but that if the

pots were plunged in tan, sand, or saw-dust, it would be of material advantage to the plants, by keeping both a more equal degree of temperature and moisture round their roots.

CONSTRUCTION OF THE PINE-HOUSE.

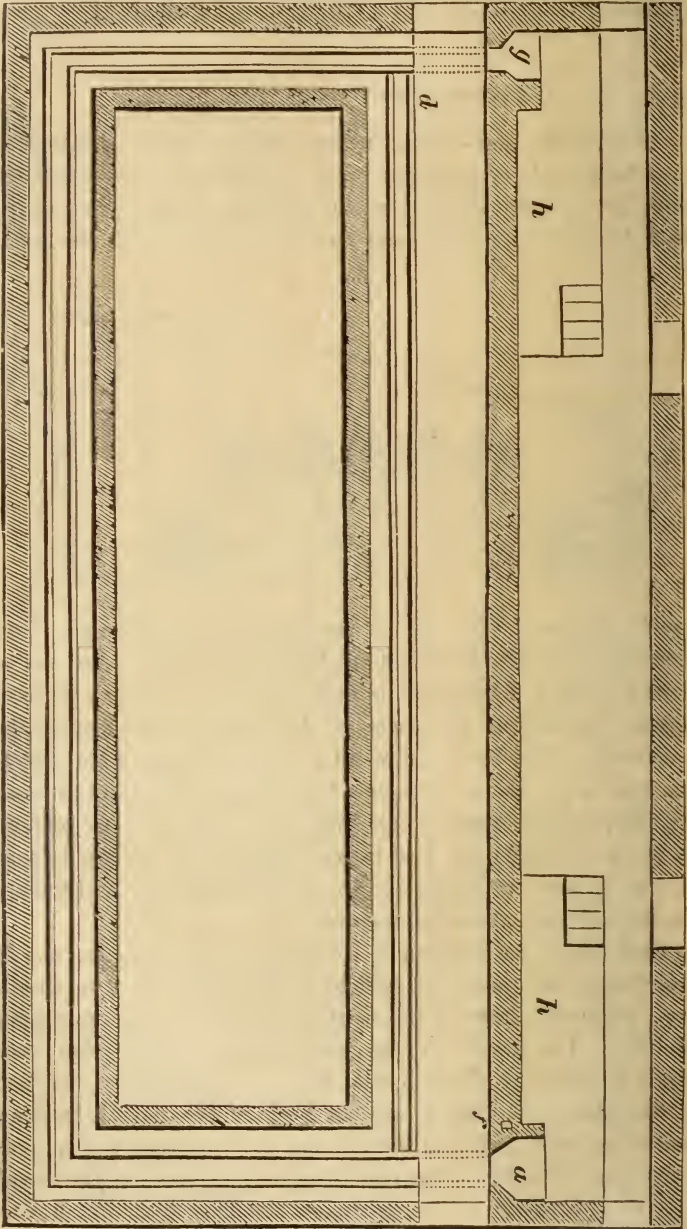
The fruiting pine-houses in the royal gardens at Kensington may be considered complete of their kind, and are calculated both for the cultivation of pines and vines, the former in the bark-bed (*a*), as in the accompanying section; and the latter



up the rafters of the roof. These houses vary in length, from thirty-three to fifty feet, and are fifteen feet wide within walls. The pit for the plants (*a*) is nine feet wide, the back path (*b*) forms a border for the roots of the vines planted against the back wall. The bark-bed or pit is surrounded by a flue (*c d*); the curb is twenty-seven inches from the glass in front (*e*), and four feet eight inches from it behind (*f*). The vines are planted in the back border (*b*), and trained under the roof directly over it, and others are planted in the front border (*g*), and trained up the rafters in the usual manner.

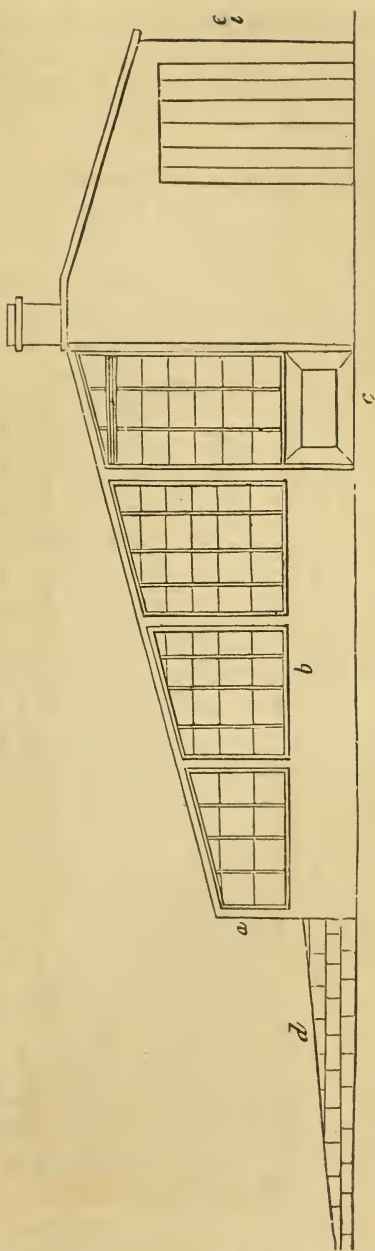
Each house or division is heated by two furnaces, one of which is for the most part sufficient, and the other as an auxiliary, when the state of the weather demands an extra supply of heat. The first (*a*), in the accompanying ground plan, proceeds to the front of the house, and runs parallel to the bed to the other end; then along the back of the pit (*d*), passing under the back path and terminating in the chimney (*f*), near to where it entered. The extra furnace is placed at the other end of the house (*g*), passes under the back path which con-

ducts it to the principal flue (at *d*), which it joins, and travels in the same tunnel, til it makes its escape at (*f*). As this



latter furnace is not often in use, its connection with the other is cut off by a damper, at the point of junction at (*d*).

The height of these houses is only nine feet from the ground to the top of the back wall. The rafters are of wood, as are also the sashes, and are placed at about four feet apart centre from centre. The front sashes (*a*), in the accompanying end elevation, are only one foot six inches high, and slide past each other in the process of giving air, the middle end sash (*b*) also slides for the same purpose. The sill of the door (*c*), and the back path of the house, are on a level with the outer surface of the ground. The front border (*d*) is raised above it considerably, a provision judged necessary on account of the damp bottom. The furnaces are placed in the back sheds, and are sunk three feet below the surface (*h h* in the ground plan), to give them a sufficient draught. Pine-houses constructed upon the above principle, have given the greatest satis-



faction; and, we may add, that were such houses heated by hot water, according to Mr. Atkinson's method, they would be all that could be wished for, as far as the structure and mode of heating are concerned, in this important branch of gardening.

The accompanying elevation, sections, and plan, are of a pine-house, executed from the designs of W. Atkinson, Esq., and heated by hot water, and have been found to give the greatest satisfaction, and may be considered the perfection of the principle; the temperature here has been sufficient, under every circumstance, to prove, that the hot-water system, as recommended by that gentleman, is amply sufficient to bring to perfection "the king of fruits." In this house, the roof-sashes are fixed, and the air is admitted by the ventilators (F and G). The boiler (*a*) is placed in a niche in the back of the house, and is heated and managed from the sheds behind. The pipes (*d d*) convey the heated water from the boiler to the front of the house, along which it travels to the ends, and heats the water in the reservoirs (B B), or rather displaces the cold water in them, which finds its way back to the boiler through the single pipe (E), which it enters near its bottom, as is shown in the section. This house may either be divided by a glass partition in the middle, and both divisions kept up to an equal temperature, or, if desired, it may be all in one. In the former case, it would be convenient, when it may be desired to grow certain kinds of pines separately, one, for instance, being filled with Queen pines, which produce their fruit many months sooner than those which are of larger size, and generally denominated Black pines; or one division may be started into fruit before the other; or may be dedicated to those which have shown fruit in autumn, and are intended to ripen late in winter, or very early in spring. Such houses as this, we consider to be all that can be wished for, in the cultivation of the pine; and to those who prefer to continue the mode of heating by smoke-flues, it is our opinion that none answer the purpose better than the Kensington pine-houses, recommended in this article. (See *Plate*.)

Steam, as a bottom heat, has been repeatedly tried, but without that success which was expected. This was predicted

by Speechly and M'Phail long ago, and, until the present time, their conjecture has been verified. We find, by a communication in the Hort. Trans., that Mr. Gunter, at his gardens at Earl's Court, tried steam as a substitute for tan, by introducing it into a vacuity in the bottom of the beds. His beds were formed of mould, and the plants planted out on them, the whole being supported on rafters, covered in some parts with brush-wood, and in others with perforated planks. The heat obtained from the steam was found sufficient, but what is rather singular, no vapour penetrated through the mould, which soon became so dry and burnt up, that even waterings repeated often were not sufficient to keep the mould in the beds in a state fit for vegetation. In the gardens of Count Zuboff, at Petersburg, steam has been applied to heat a large cistern of water, the whole size of the pit, which, when once heated, continued to give out its heat gradually and for a long time.

Steam-pipes have often been introduced into pits, and covered with fragments of stone, gravel, saw-dust, and coal-ashes, upon the surface of which the plants in pots were sometimes placed, and in other cases plunged into the latter materials; and in some cases, the cavity in which the pipes were placed was covered with perforated planks, for the ascent of the heat; but, in most of those instances, the success was far short of that of pines plunged in a bottom heat, produced either from tan, leaves, or dung. The refuse in the process of dressing flax has been used in many parts of Scotland, to produce a bottom heat, but the heat produced has been found too violent, and of short duration. Moss, (*Hypnum*,) has been suggested lately by Mr. Street; and, as its decomposition and fermentation proceed slowly and never violent, it is probable that it may be successfully used as a substitute for tan, leaves, &c.

Having so far entered into detail on the means of obtaining a sufficient degree of bottom heat, for the growth of these plants, we will now proceed to detail their general management throughout the year, in the three departments of nursing, succession, and fruiting pits or beds; and in so doing, we

will suppose the plants to be growing in beds of tan, leaves, dung, or a mixture of all, and when reference is made to the temperature, it is to be understood as applying to the scale of Fahrenheit's thermometer, as being in the most general use in gardens.

In addition to this, however, may be added that of Six's, and denominated Six's registering thermometer. It will be found useful as a check on the person, who has the charge of the fires, it being so constructed, as to indicate the extreme points to which the heat has fallen or risen in the course of the day or night; and for ascertaining the temperature at the roots, or in any part of the bed, we recommend the pine-bed thermometer, invented and manufactured by Mr. Bregazzi, price 1*l.* 12*s.* 6*d.*, which may be procured by means of any of the respectable London nurserymen.

NURSING PINE PLANTS.

The temperature of this department should now be kept up, as near as can be to 65°, mornings and evenings, and in sunshine, on good days, it may be permitted to rise to 70°. In whatever way this department be heated, whether by fire-heat, steam, dung, or tan and leaves in a state of fermentation, the same degree of temperature should be kept up, which can be readily done by any of those materials. The general management of the plants will be the same, in whatever way the temperature is kept up. Air should be freely admitted every good day, dividing the quantity so admitted regularly, that a equal circulation may be in all parts of the pit or frame. Whatever the state of the weather may be, it is necessary that the confined air be allowed to escape, which can be done by tilting up the ends of some of the sashes an inch or more at the front, and a corresponding number being also opened at the back; the confined air being lighter, by reason of its being much warmer, will either rush out or be displaced by the pressure of the cold, and of course the heavier air, forcing in on the opposite side will in a few minutes charge the pit with a volume of fresh air.

which will supply the plants till furnished with more by the same means, or till more favorable weather. Indeed, there is much more injury done to the plants, by being too long confined in a close unwholesome atmosphere, than by allowing fresh air into the bed, should it even lower the temperature 5° or 10° . Little water will be required at their roots at this season, once in twelve or fifteen days will be often enough, even where fire-heat is used. Still it will be necessary not to fix any precise time for watering, but to perform it accordingly as the plants may require it. Those which stand next the flues may require it oftener; and such as are strong and vigorous will require some water, while others that are not so luxuriant may thrive without any, even for a greater length of time. This is a matter of some importance, and therefore the plants should be examined, at least once a week, at this season, and only then, such as may really want it should be watered. It is better to give a little and often, than to deluge them at once, and leave them for a week or two without any water

In watering pines during the winter, some of the best cultivators apply it from 80° to 85° of heat, and some much warmer. Water applied to their roots, or over the leaves, in a cold state, is evidently a bad practice; we should think a pretty good criterion might be fixed, by applying the water at, or a little above the temperature of the air of the house. Even in summer, water should be exposed to the influence of the sun for some time previously to its being used, or rendered mildly warm by the addition of a portion of water heated for the purpose. It is, perhaps, not going too far to suppose, that cold water applied to the roots, or over the leaves of plants, while exposed to a temperature of from 80 to 100 degrees of heat, produces effects somewhat analogous to persons drinking it while they are in a state of high perspiration.

Those pits, however, which are wholly heated by means of fermenting matter alone, will not require watering so often, as a considerable moisture will be supplied from the materials undergoing the process of fermentation. To promote a still

moister atmosphere in the pits or frames, they may, in fine days, be syringed all over with water brought to the temperature of the air of the pit or frame, but this should not be done in a careless manner, a little being sufficient at a time, and it is also of importance that it be regularly divided over the beds. In dull cloudy weather be more sparing of this mode of watering; but in clear frosty weather, when there is some sunshine, it may be given more largely. It is safer to give too little water at this season than too much, and it should be administered in the forenoon of such fine days as sometimes happen at this season. The operator need not open every light for this purpose, but syringe the whole from the middle; or, if the pit or frames be long, at equal distances from each end. While the watering is going on, a second person should hold a mat over the operator to prevent too much cold air from rushing into the pit. This watering over head is of much consequence, where the forcing is carried on by means of steam or fire-heat only, as, in such cases, the internal atmosphere of the pit or frames is generally too dry for any plant almost to live in; and were not the pine one of our hardiest exotics, and capable of living in such artificial climates, that almost no other fruit-bearing plant could exist in, more instances of failure would occur from this practice alone, than from all the other bad modes of cultivation combined.

Such crowns and suckers as have been taken off the fruit or plants late in autumn, and are not yet well rooted, will of course be kept at one end of the pit or frame, and can be supplied with much less water than such as have struck root, and will soon be beginning to make both fresh roots and leaves. The sashes should be covered up carefully every night, with mats or thick canvas covers, and over them some reed-mats should be placed, as being capable of throwing off the rain or melted snow, which the canvas, and more particularly the mats, would let pass through to the glass; and, if the sashes be not in excellent good order, would penetrate into the plants, which might be the cause of too much damp, besides chilling the atmosphere of the pit or frame too much. This covering should

be put on about sun-set in the evening, and removed by sunrise in the morning, or soon after, and should never be kept on during the day, excepting in very severe weather indeed. Light and air at this season are the principal *natural* agents for keeping pines in health; and when either is withheld for any length of time, the plants will soon lose color, and assume a sickly appearance. Whatever way pine-pits or frames are heated, covering the sashes at night is certainly a great saving of fuel, where that article is expensive.

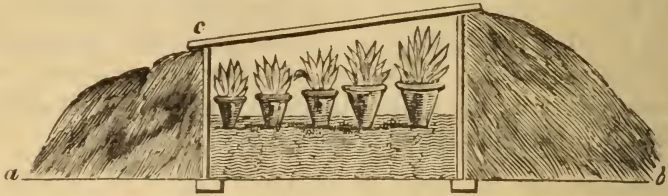
SUCCESSION PINE PLANTS.

The plants in the succession house or pit, should be managed much the same as the nursing-pit, already described. The temperature should be kept as near to 60° as possible, and should not be allowed to exceed 65° , as sudden transitions at this season would be apt to start the plants into fruit, which would be next to losing them altogether. Less heat should generally be allowed succession-plants, than even those in the nursing-pits, in order not to draw them; and during their continuance in the succession compartment, they should be allowed more room in the bed, and be frequently shifted, and abundantly supplied with air and water, in order to strengthen the heart or root part of the plant, that they may be able to throw up strong fruit. The admission of air may be regulated, as directed above for the nursing-pit, and water should be given in moderate quantities every ten or twelve days. The covering should be, in like manner, attended to mornings and evenings.

CONSTRUCTION OF SUCCESSION PINE-PITS.

As an example of an economical and useful succession pine-pit, we give that of Mr. Aiton, in the royal gardens at Kensington, which is the same as that of Baldwin, in which he has so successfully cultivated this fruit, and of which the accompanying figure will give an idea. In the Kensington gar-

den, the soil being damp, they are raised on a platform (*a b*), a little above the surface, to render them dry at bottom, which is a very necessary precaution. In front, they are provided with a gutter (*c*), which is of material consequence, by keeping



the lining in front dry, and thereby preventing the heat from being interrupted, or the bed suddenly chilled, during and after heavy rains. The plants are often fruited in these pits in the royal gardens, but, for the most part, they are removed into the fruiting-house, recommended in the last article. The best cultivators of the pine prefer to grow their plants in pits, in preference to the old practice of growing them in larger houses, or deep pits, heated in a great measure with fire-heat. Many varieties of pits for this purpose have been recommended, but we see nothing in them superior to the above, which combines all that is necessary, under good management, to grow this plant in the first degree of excellence.

FRUITING PINE-PLANTS.

The plants in the fruiting-pit will require to be treated the same as the succession-plants above. Keeping the temperature steadily at from 60° to 65° , as it will be more desirable for general purposes that the plants do not start into fruit till the middle or end of next month. Some sorts of pines are, however, found to swell tolerably well during the winter; such, therefore, as are in fruit, should be kept as deep in the bed as possible, so that their roots may enjoy a sufficient share of heat to forward the fruit at this time, when the general temperature of the house cannot be kept sufficiently high for them, without sacrificing the remainder of the plants, whose general crop of fruit it may be desirable to keep back to a later period

of the year; they should also be liberally supplied with water at their roots, and be frequently sprinkled over head with clear water, to refresh their leaves.

Most of the generally cultivated pines, however, are found not to succeed so well, if brought into fruit at so early a season. Where pines are cultivated upon an extensive scale, it is better to have separate fruiting-houses, and indeed succession-houses for the different sorts, that will swell their fruit in winter, and also for such as fruit at a more advanced season. Small houses, therefore, have this important advantage over large ones, that the crops, of whatever kinds they may be, can be brought into fruit in regular succession, which cannot be done so well in houses of more capacious dimensions, where the inhabitants require a very different treatment, particularly as regards temperature.

Thus, if a separate fruiting-house was appropriated to *Queens*, and some of their nearest associates, they might be fruited in nine months, or even twelve months, less time, than those that are generally by gardeners denominated black pines, which include the larger growing sorts, such as the *New Providence*, *Globe*, *Black Antigua*, and *Enville*, which require three or four years' cultivation, and upwards, to bring them to due perfection, and which, when grown to the amazing weight of ten or twelve pounds, may well deserve a separate house for their reception.

It not unfrequently happens that a quantity of water lodges in the hearts of pine-plants, either from the rain or melted snow finding its way through the sashes, in consequence of bad glazing, or not being in a proper state of repair, and often from the excess of watering over head, assisted also by the condensation of steam falling into them from the glass. When this is observed, particularly during winter and autumn, it should be drawn out by the syringe made for the purpose, and which can be purchased of any respectable nurseryman, or may be made by any ordinary intelligent tin-smith; or, in want of such an instrument, many cultivators use a small tin tube, one end of which they introduce between the leaves of the plants, and draw the water out by sucking it up with their mouths.

Fruit of the New Providence pine has been grown in the garden of W. Crawshay, Esq., Cyfartha Castle, Glamorganshire, of the following extraordinary weights; one twelve pounds fifteen ounces, one ten pounds eight ounces, one ten pounds, and two nine pounds each. In the same garden, twelve queen pines have been cut, weighing altogether thirty-five pounds.

FORCING VINES.

Attempts have been made to have crops of grapes ripe in March, by beginning to force in August, but after much expense and trouble, this practice has seldom realized the expectations of its most sanguine advocates. The time of ripening is not always early in proportion to the time of beginning to force. When the course of forcing coincides nearly with the natural growing season, ripe grapes may be cut in less than five months; when short days compose a third part of the course, in less than six months; when the course includes full half of the winter, it will require seven months before we can calculate upon ripe fruit, and then it will be of an inferior quality. The best time to begin to force is the first of March, if the object be to obtain a good crop of well-flavored grapes moderately early. In proportion as the state of vegetation is put into action before that time, the natural habits of a deciduous plant, and the unfavorable state of the weather, will leave a great number of obstacles, and discouraging contingencies to retard final success.

Those who are ambitious to have early fruit, to answer the demands of the market or their employer, and who have several grape-houses, generally begin to force the earliest by the middle of December, and sometimes in November, and successively in other houses the first day of the year, the first day of February, and the first day of March. To go through the details of all these houses, would lead to frequent repetitions which might tend rather to confuse than otherwise, and therefore we will confine our observations to one department, and begin with the year to regulate the vinery, and have every thing in order for commencing forcing by the first of February.

About the beginning of this month, let the flues be properly cleaned out, and such repairs as may be necessary done to the houses; at the same time, let the walls, flues, &c. be well washed with water, and afterwards white-washed with hot lime or whitening; the wood-work and glass washed with soap and water, and the trellises and vines anointed with a mixture of soft soap, sulphur, and tobacco. The borders should be forked up, and the vines, supposing them to have been pruned in November or December, fastened to the trellises, in a neat and orderly manner. The surface of the border should be covered with a coat of rotten dung two or three inches thick, and well watered with the drainings of the dung-hill, sufficient to penetrate to the full depth of the border. This watering should be repeated occasionally during this month. The border on the outside should also be covered with five or six inches of good moist dung, if not done in autumn, which will be of much benefit to the vines, by protecting their roots from the effects of severe frosts, as well as contributing an additional supply of nourishment to them; and, indeed, this and the application of liquid manure, are the only means of supplying the necessary nourishment to them, as digging it in would be attended with serious consequences to their roots, however carefully the operation may be performed.

Some cultivators have recommended supplying the roots with liquid manure, by forming drains under the surface, and allowing it to escape from them into the borders; but when that "nectar of vegetation," as Nicol calls it, can be supplied by the simple process of pouring it upon the surface, or by spreading rich half-rotten dung upon it, as recommended above, we see little to be gained by such drains. The liquid manure, applied in itself, will find its way sufficiently deep into the borders, if supplied in a sufficient quantity, and the natural rains of winter will wash down sufficient nutriment from the dung, and should that be thought not sufficient, repeated waterings may be applied as an auxiliary.

The border should, as directed for the interior one, be carefully forked a few inches in depth, merely to render the surface more porous, and capable of admitting the juices of the dung, but care must be taken not to injure any of the

roots that may be near the surface. About the beginning of the month, or indeed as soon as the operations of cleaning and washing the house are commenced, the sashes should be put on (if they have been at all removed), and shut up every night, as well as during heavy rains or snows during the day, but a sufficient circulation of air should be admitted during the day, either by the lights or by means of ventilators, to keep the temperature nearly equal to that out of doors, till towards the third week in the month, when it may be allowed to exceed the external temperature a few degrees. During the third week, slight fires should be made throughout the day to dry the flues, and if they raise the temperature in the house, give sufficient air to keep it within due bounds.

If the vines be planted outside of the house, they should be protected by means of moss or hay-bands first wound round their stems, then covered with long littery dung or fern-fronds, secured from being blown about by a piece of old mat, or any such covering.

The stems of the vines inside the house, and their larger branches for some feet from the stem, should be covered with moss or soft hay wound round them, and watered frequently with a syringe, which will keep the stems moist, and will contribute to their breaking stronger, and the production of vigorous shoots. In cases of hard forcing this is particularly necessary, and should always be done to such vines as are planted in pine-houses, particularly such as are planted within the house.

The able conductor of the *Gardeners' Magazine* make the following excellent remarks upon Mr. Shephard's practice: "The vines have been in a state of continued pine-apple heat for thirty, and some for nearly forty years, and during the whole time bearing excellent crops. The sorts are chiefly the Black Hamburg and Sweetwater, with some Muscats. Mr. Shephard's general practise is to keep his pines at a very low temperature during autumn, and very high in the beginning of summer, the difference between which gives the vines a comparative winter; add to this, that they are chiefly trained over the back path, and that, by letting the sashes down during the greater part of the day in September, the leaves and shoots

are exposed to the direct influence of the weather. A sort of winter is, in some cases, produced, or at least prolonged, by training the shoots so closely under the roof glass as even to be in contact with it: that position being, in the winter season, the coldest in the house, owing to the radiation of heat from the exterior surface of the glass. Mr. S. strips the leaves off the vines every year, in the end of October or beginning of November, because, soon after the latter period, the sap begins to rise. In general, the Sweetwater vine so treated ripens its fruit about the beginning of April, and the Hamburg about a month later. The plants at the warmest end of the house, where the flues enter, in some cases ripen their fruit a month earlier than those at the cold end, and the vines in the succession-neries are, of course, much later than those which are ripening their fruit. By this means, a succession of grapes is obtained from April to July. The stems of most of the plants are within the houses, in general in the back path, and the vines trained under the glass over that path; but sometimes they are planted in front, and trained under the rafters. In the latter case, the roots extend into a front border; in the former, they extend under the tan-pit, and into a border behind the back wall. The borders are never dug, but every year a coating of about a foot in thickness of half-rotten dung is spread over them, to keep out the frost in winter and the drought in summer, and to nourish the roots and encourage them to come to the surface."

We find our own opinion coincides with that of Mr. Acon, a very successful cultivator of the vine, in a communication to the Hort. Soc., the substance of which is as follows: the elastic powers of the wood are restored by a few weeks exposure to a cold atmosphere, which it never fails to lose when long confined in a warm dry one; exposure to frost promotes a disposition in them to break into bud much stronger and more uniform.

A supply of grapes throughout the year is a desirable matter, and has been often attempted with more or less success. In a communication in the Hort. Trans. by Mr. Acon, we find the following to be his practice: he arranges it so, that "the late house crop lasts from the middle of January to the end of

March; this is succeeded by the first crop in the early house, which carries on the supply into May, and it is continued by the grapes on the rafters in the same house, until the pine-stoves, which are forced early in January and February, produce their crops. These keep in bearing through the summer, when a vinery, which I begin to force about the end of March furnishes the supply till the late house fruit is ready in January. This completes the succession." To effect this, he grows his early crops of grapes in a wide house with a flat roof, and plants the vines both on the back wall, and also on a trellis proceeding from the front parapet-wall to within as great a distance of the back wall as admits of a sufficient walk or passage between them. This trellis is at a considerable distance from the roof, and placed at an angle that casts the least shade on the back wall. The vines upon this trellis, and those on the back wall, are begun to be forced on the first of September, and by his process produces ripe grapes the first week in March, which last till May. Six weeks after the vines above are put into a state of vegetation, he introduces another set of vines from the front, and trains them up the rafters. These latter introduced vines produce their fruit early in May, and last till late in June. To prevent too much shade, only one shoot is allowed to each rafter, and throughout the whole system of pruning, no more wood is left than is sufficient to secure a crop, both in the late and early houses; and in the summer pruning, the fruit-bearing shoots are pinched off at the joint above the fruit.

"When the crop is over, and the wood perfectly ripe, the branches should be laid near the ground, and shaded till the recommencement of the forcing. By this practice, they will be found to have accumulated excitability. The shade will have some affinity to the gloom of winter, which never fails to give vegetation increased energy. Plants which have been forced early will always have an inclination to bud at the accustomed time, whilst it is difficult to move those which have never been habituated to forward excitement, but the habit once induced will continue, and will enable the cultivator to procure fruit at any time."

The vinery in which he produces his late grapes is much narrower than that in which the early crops are produced, and having the roof also much steeper. The forcing, if we may so call it, in this house commences about the middle or end of May, by shutting up the house, and until the vines are out of blossom a warm temperature is kept up. "This," he justly observes, "is of more importance than is generally imagined. The wood which has to bring the future crop will be all made during this period. In a good heat it will be found to grow more compact, and to receive a form better calculated to produce and ripen fruit, under the cold atmosphere to which it is afterwards exposed. If the house be kept too cool at the beginning, the wood will be soft and long jointed, and therefore subsequently barren. Those who attempt to grow late grapes must pay serious attention to this circumstance, the failure of many may be attributed to the neglect of it."

The sorts of grapes preferred for this late forcing are the Black Damascus, St. Peter's, and Muscat of Alexandria, as they have the properties of continuing much longer in a perfect state after they are ripe, as well as their ripening better, after the sun becomes less powerful than any others. It is, however, necessary to complete the success of this late forcing, to have the berries perfectly coloured before the season is too far gone. A mild temperature being maintained during winter, these will be fit for cutting by the middle of January, and continue in perfection till those in the early forced houses come in, in March.

The vinery recommended by Mr. Atkinson for early forcing is now in very general use, and may safely be recommended as the most economical and rational of any. The accompanying plan, section, and elevation, will illustrate its principle. The roof sashes are fixed, and air admitted by the ventilators (A and B). These vineries have hitherto been heated by smoke-flues, but may be heated by hot water, the pipes and boiler to be placed where the furnace and flues are represented. In the accompanying plan, the furnace is placed in the sheds behind, and the flues entering the house under the floor level, proceed to within a reasonable distance of the front wall to admit of the vines being planted inside the house; they then rise above

the surface, and proceed to the further end of the house, where they make a turn, and return to that part of the house where they entered, and the smoke is discharged in the shaft at (C). The front wall is built on arches, which are within a few inches of the surface, to admit of the roots of the vines finding a free means of reaching the border outside the house. Such houses have been very generally recommended by that gentleman, and are, under different modifications, to be met with in many of the first gardens in the three kingdoms, and, where the cultivation has been judicious, the success in regard to crops has been complete. (*See Plate.*)

The distance at which vines should be planted, in forming a new vinery, is not easily determined, as much depends upon the kinds intended to be cultivated, the mode of training to be adopted, and other circumstances. It is, however, always better to plant too many than too few, as the cost of plants is trifling, and should any fail, or others turn out upon fruiting to be of sorts of minor value, the remedy is in cutting the least worthy out. We have observed already, that one vine of a good sort, such as the Black Hamburg, will soon completely fill a large house, and, under good management, produce as great a weight of well-flavored fruit, as any number of the same kind filling the same space; and when variety is less a consideration than quantity, this practice is not to be condemned. The most general mode of planting vineries, is to place one plant to each rafter, with a view to permanency. Many excellent gardeners, however, plant many more, both for variety and to suit the mode of pruning and training to be afterwards adopted by them. Amongst the latter, we can instance Mr. M^rArthur, F.H.S., gardener to A. Baring, Esq., who is one of the most successful cultivators of the vine, as well as one of the best gardeners in the country. The success of his mode of culture, we have often had the pleasure of witnessing, and can safely assert that we never saw finer crops produced. The vines in his houses are planted without any regard to distance, or number. By having many vines in one house, each has consequently a less number of bunches to produce, and may therefore be expected to produce them of greater size, both in the bunches and in the berries. But

we have, also, often observed vineries planted equally thick of plants, without producing crops of any merit. It therefore appears, that more depends upon the system of good management than upon the distance at which they should be planted, the mode of training, the form of the house, or any of the many points advocated by some of our theoretical horticulturists. In planting vines, some attention should be paid to the situation each should occupy in the house, according to the lateness or earliness of ripening of the kinds. Thus, if vines of early ripening be planted at that end of the house where the flues enter it, and later sorts at the end farthest from the fire, the season of grapes will be prolonged for a greater length of time; and if this order of arrangement be reversed, the crops will be more uniform in their order of ripening. Vines of delicate habits, such as the Frontignacs, should be planted by themselves, and not mixed with the more hardy and luxuriant-growing kinds, as in that case the former would be robbed of their share of nourishment by the latter; and probably a want of attention to this point may be the cause of so many complaints of the want of success in the cultivation of the finer kinds of grapes, when planted promiscuously among others. Some grapes require a greater degree of heat to ripen them in perfection than others, such therefore should be planted in pine-stoves, or in separate houses by themselves.

Speechly, in his "Treatise on the Vine," justly condemns the practice of planting all the different sorts of vines at the same distances, and recommends planting in proportion to the natural character and qualities of the kinds. Vines planted at three or four feet distant, he considers as crowded, and observes that, although by this mode a house will soon become furnished, yet in a few years time they become cramped for room, and are, consequently, rendered less productive. For those vines which have a space of twelve feet in height to grow, he recommends the more robust kinds to be allowed twelve feet distance at their roots, plant from plant, and the less luxuriant ones, a distance of six feet from each other. But, in order to fill the space to be covered with vines, he purposes to plant temporary plants, to be cut out as the permanent ones extend in growth. Such temporary plants he advises to be

grown to a good size in large pots, so as to come immediately into bearing, and to be so trained as to fill the upper part of the house or wall, while the permanent ones are filling the lower parts.

FORCING PEACHES.

Peaches are frequently begun to be forced in December and January, and become ripe in May. Little is gained by commencing sooner. But for a general crop, most gardeners prefer to begin by the first of February; and for this purpose, they begin to prepare the house during the month of January, supposing the trees to be healthy and fully established, and that they have not been pruned in November or December, when the vines were pruned. About the beginning of the month, let the flues be properly cleaned, and such repairs as may be necessary done to the house, the whole of them washed with water, and afterwards the walls and flues whitewashed with hot lime, to give the whole a neat and clean appearance.

Supposing the trees to be established, and their wood of moderate growth, neither luxuriantly strong nor yet too weak, they will of course be sufficiently ripened, having been forced the preceding year. If the shoots have been laid in a proper distance, and in a regular manner, during their summer training, they will require but little pruning at this time. First go over the whole of the trees, and examine what wood is worn out or nearly so, and if there be enough of young wood to fill up such spaces, then remove all or part of such branches as are exhausted. This should be done annually, so that it will not be requisite to cut out too much at once, as no tree is so impatient of severe pruning as the peach. Such shoots as are thus laid in to fill up the space occupied by the branches removed, should be shortened in, more or less, according to their strength, and the size of the space to be filled up, in order to cause them to break in such parts, and to push such a number of shoots as will fill the space intended as soon as possible. The summer shoots should be gone over, and a few of such as are near the bottom or middle of the tree shortened, or where there is a deficiency of proper wood, to cause a growth of young wood to supply any vacancies that may hereafter

occur in the tree; but such shoots as are short, stout, well-ripened, and nearly of an equal thickness, having a good wood-bud at their extremity, and a number of blossom-buds arranged along them, should not be shortened, but laid in at full length, for from these may be expected the finest fruit; and, indeed, in most cases, it would be useless to shorten them, as they seldom have wood-buds, except at their lower and higher extremities. Shortening, therefore, unless at a wood-bud near the bottom of the shoot, would destroy the whole; for if they be shortened any where but at a wood-bud, although the fruit might set, still it would come to nothing, in consequence of the want of a terminating shoot to draw nourishment for its support.

We are informed by Mr. Patrick Neil, in Hort. Tran., that M. Du Petit-Thouars, an eminent French physiologist and peach-cultivator, has drawn conclusions considerably at variance from this received opinion. "He denies the propriety of the distinction usually made of wood-buds and flower-buds; but states, that in the peach-tree for example, each leaf produces a bud at its *axilla* or base; this bud soon becomes triple, the two outer proving flower-buds, and the middle one a leaf or wood-bud. When this central bud happens to be favorably placed, it sometimes develops itself indefinitely, and produces the anomaly of a *gourmand* or robber. He has also announced that the embryo flowers of peaches, apricots, pears, and apples, are palpably formed as early as midsummer of the year preceding that in which they are unfolded, and produce fruit. He asserts, that the branches of a mature tree produce regularly every season an equal average quantity of embryo flower-buds, and that if these fail to be duly developed, it must be owing to the low temperature to which they are subsequently exposed during the winter, or early in the following spring." If he be correct in these observations, the affording protection to such fruit-trees in the early spring months, acquires additional importance, and furnishes one of the best reasons yet given for protecting such as are in peach-houses, by allowing the sashes to remain permanently on them, as recommended by Mr. Atkinson.

Towards the extremities of the trees, provided that they have not yet filled their respective places upon the wall or trellis, most of the shoots, particularly the strongest, should be shortened, in order to cause them to push out shoots to fill the space, as they proceed. If this be not attended to, the shoots will extend themselves to a great length, and become naked and useless. All parts of the trees that appear too crowded with shoots, should be regularly thinned out, and the whole tree as it were balanced, or regularly supplied, with young wood from bottom to top, which, from the nature of the tree, will readily be accomplished, if sufficient attention be paid to a judicious mode of pruning.

The pruning being finished, let the whole of the trees and trellises be washed or anointed with the mixture, as directed for vines, and this should be done carefully, for fear of destroying the buds, which will now be much swollen. Lay the young shoots flat in one hand, while with the other gently draw a piece of sponge, dipped in the liquor, upwards (*but not downwards*), or the reverse way of the buds, two or three times, so that all filth may be washed off, and a good portion of the composition made to remain on the trees. The older shoots should be well scrubbed, upwards and downwards, to remove all filth, and the rubbing continued until the bark of the tree is well charged with the composition; indeed, the larger branches should be frequently anointed, before the blossom begins to expand, to soften their outward bark, and leave a greasy appearance upon them. Tincture of *Digitalis*, diluted in water, in the proportion of one ounce of the former to three pints of the latter, has been recommended for the destruction of the green-fly upon peach-trees; the application is made by sprinkling the liquid on the leaves or branches infested; and in many cases this is more conveniently applied than fumigation with tobacco-smoke. If the trees have any appearance of mildew, it should be now carefully attended to. The points of the shoots should be examined, where the mildew is only at this season likely to be discovered, and if it can be done without injuring the form of the tree, or removing shoots that can ill be spared, the infected shoots should be removed

as far down as the disease appears. However, if the shoots cannot be conveniently spared in course of the pruning, anoint such as are infected with a thick coat of sulphur, made into a paint-like substance by soap and water. This will soon eradicate it, if it has not become constitutional, or does not arise from an improper soil; in such cases, the border must be entirely renewed, and if the trees be much exhausted, they also must be removed and fresh ones planted, which may be taken either young from the nursery, or established from some of the walls in the garden, and carefully removed into the house; but where such is the case, it will be advisable not to force the house early, or if it cannot be avoided, allow few fruit to form upon such trees as are thus brought in. This will enable them to make wood sufficiently strong to secure a plentiful crop the following year.

The pruning and anointing being finished, let the whole be neatly tied to the trellis, about six or nine inches apart, according to their strength, with neat pieces of matting, well twisted, and moistened in water to add to their toughness. The larger branches should be arranged first, and the smaller ones laid in between them in regular order, observing, in tying the shoots to the trellises, to allow plenty of room for the shoots to swell. A general rule is to allow as much as would admit another shoot of equal size along with the one tied in. This being accomplished, fork over the borders of the house carefully, so as not to injure the roots of the trees, and give the whole floor of the house a good watering or two with liquid manure, either prepared for the purpose, or collected where it drains from the dunghill, sufficient to penetrate to the bottom of the border. The border outside the house, as far as the roots may be supposed to have extended, should also be forked up a few inches deep, in order to allow the rains to wash down the juices of the dung, with which the border should be covered to the thickness of three or four inches; this dung should not be too much exhausted, but be pretty good, in order to manure the roots. Although we do not approve of highly manuring the borders of peach-trees upon the open walls, still we think it necessary to feed such as are artificially forced with more strong food. Peaches do

not naturally grow under glass, and therefore should be artificially planted, pruned, and fed. It is a very common practice to dig in a quantity of rotten dung into the borders of peach and grape-houses; we have, however, always used liquid manure, and consider it preferable, as it can be applied without injuring the roots of the trees, and answers all the purposes of manure in any other form equally well, if not better. Towards the second week of the month, the house should be covered in, that is, the glasses put on, and the house sufficiently ventilated during the day, to keep the temperature nearly equal to the external air, covering up every night and always throughout the day, when there is any danger of heavy rains or snow. If the sashes be put on before the foregoing operations of pruning and dressing commences, the whole may be done more comfortably, and in that case, the rains or snow will not wash off either the composition put upon the trees, nor wet the flues, which should now be kept as dry as possible.

FORCING PEACHES IN POTS OR BOXES.

Peaches and nectarines are well calculated to force in pots or boxes, which should be large enough to contain at least one cubic foot of mould, and constructed like those recommended for cherries. The soil should be both much lighter and richer for plants in boxes or pots, than that recommended for the peach and nectarine borders, and liquid manure should be abundantly supplied to make up, in some measure, for the confinement of their roots. When established for one season in tubs or pots, they are then fit for being brought into the houses for forcing, and if managed as directed for cherries, plums, &c., will answer every expectation. The plants should be first placed in a temperature equal to that of the greenhouse, and afterwards removed into the peach-house or vinery, when the fruit is set. They will require copious supplies of water at their roots, and the surface of the mould in the pots should be covered with rotten dung, still more to exclude the action of air upon their roots, and if the tubs or pots be covered with ropes made of moss or hay, and kept somewhat moist, the success will be greater. Trees thus cultivated are

sometimes trained to small fan-trellises fixed to the pots, but they answer and look much better when trained as dwarf-standards, in which form peach-trees always ripen their fruit much better than by any mode of training practised. When the fruit is nearly ripe, they may be removed to the greenhouse or conservatory, where they will have a good effect, if arranged amongst the exotic plants in either compartment. Sometimes they are slightly forced, and removed into the open air, where they should be partially shaded from the sun for the first eight or ten days, and then placed in the flower-garden or some sheltered spot till they fully ripen. In this way the fruit becomes extremely high-flavored, and of a beautiful color. Occasionally, in very warm seasons, the peach and nectarine-trees thus treated, if forced very early and plunged out into the open air, will produce a second crop in autumn, similar to strawberries or cherries, which have been early forced; but in this case, the trees seldom recover from the effects of the experiment, which can only be considered as a matter of curiosity, and not utility. Fruits thus ripened, in handsome ornamental pots, vases, or neat architectural boxes, are often placed upon the table, with their ripe fruit upon them, where every one can help himself; in this way they have an agreeable and curious effect.

FORCING CHERRIES.

Of all fruits accelerated by artificial means, none are so difficult to obtain as cherries, they being apt to shed their blossom without setting their fruit. This is sometimes owing to imperfection in the parts of fructification, which we often find to be the case also with trees in the open air. The most successful forcers of cherries agree in giving as much air as possible, and regulating it as nearly as possible to the state of the atmosphere at the time the trees are in blossom, and until the fruit be set; thus giving strength to those parts naturally debilitated, and which would be rendered more so if confined in a close atmosphere.

The sorts most generally preferred for forcing are the Mayduke, and sometimes the Morella. This latter sort is much

improved by being forced, and generally is a better bearer than any of those which produce their fruit upon artificial spurs; and from the natural character of this tree, (it bearing its fruit upon the young wood of last year's growth,) it is capable of a mode of training more suitable to the confined space of a forcing-house than any other.

Cherries are sometimes planted permanently in a house, and trained to trellises, and often as standards planted in rows in the middle of the house; planting the tallest plants at the back, and the dwarfest next the front: others plant trained trees, which are trained upon a trellis against the back wall of the house, and plant the front border with dwarf-standards. In either case, where the trees are to remain permanently, it is necessary to procure such as are healthy, and of sufficient height to suit the size of the house. Trees that are two or three years from the bud are to be preferred. We would, however, recommend that the cherry-house be furnished with plants grown in portable tubs, pots, or boxes, and that the trees be preparing for that purpose a year or two before forcing. They should be selected young in the nursery, but where there are many of these trees to be forced annually, we would recommend every gardener to propagate his own. When these trees are one year from the bud, they should be taken carefully up, and potted in pots of twelve or fourteen inches in diameter at top, according to their roots and strength of the tree, or in tubs of the same dimensions, either round or square, and if so, to be made upon the principle of our orange-tree box, (for a figure and description, see *Green-house* and *Conservatory*), so that they can be taken to pieces more conveniently, and the trees taken out without injury. After they are planted, either in pots or tubs, let them be plunged in a sheltered but not shaded quarter of the garden, and regularly supplied with water during summer, and the surface covered with rotten dung, both to prevent a too rapid evaporation, as well as to nourish the trees. They should remain there until the season of forcing, which for cherries is soon enough, to expect much return, about the first of January. Such a number should then be carefully taken up, and carried into the house, as may be either sufficient for the supply required, or to fill the house.

But as figs, gooseberries, currants, raspberries, apricots, and plums, may also be introduced into the same house, a portion therefore only of the cherries may be taken in at once. They should be regularly placed in rows upon the floor of the house, which if formed of rich good loam, and forked up, so much the better, to allow the roots to penetrate through the holes in the bottom of the pots or tubs, which they most probably have done already while plunged in the open air. If such be the case, care must be taken in removing them, so as to injure those roots as little as possible. They will strike root into the floor of the house, and will derive a considerable share of nourishment therefrom. To facilitate this, the egress of the roots, the bottoms of the tubs or pots should be perforated with many holes, proportionably to their size, and in planting them not over drained, preferring, instead of broken pieces of pots, pieces of fresh turf, which will admit of a sufficient degree of filtration, and at the same time not impede the roots in their progress through the holes. Such as are intended to remain for more than one season preparing in the tubs, should be taken up any time before the beginning of the spring, subsequently to their pruning, and such roots as may have penetrated through into the natural soil cut carefully off. This will not injure the growth of the trees, but rather throw them into a state of greater fruitfulness. When such a number of trees as may be deemed sufficient are placed in the cherry-house, draw a little of the mould of the floor of the house round them, or plunge them less or more into the border, but not too deep; stir up the surface of the mould in the boxes or pots, and if no roots appear near the surface, remove a portion of it, and supply it with some rich light hazelly loam, and mulch each tub or pot with an inch or two of rotten dung, which should be frequently replaced.

The number of trees to be kept in a state of preparation should not be less than one hundred, and accordingly as any number are removed into the house for forcing, let a like number be added to the stock, so as always to keep up a sufficient supply. This number need not always be young trees; many of those which have been forced one season, will, it taken out of the tubs or boxes and headed down, if in a weak

state, their roots dressed, and planted out in a quarter of rich light hazelly loam, be, in the course of one year or two at most, fit for re-potting; and others, when the forcing has not been very early, will be in a good state to force for two or more years successively; but such as do not break freely and show symptoms of vigor, should be thrown away. The same rule which regards cherries, is also applicable to apricots and plums. It is not worth while to keep gooseberries, currants, and raspberries, after they have borne one crop in the cherry-house; they may be planted out in any part of the garden where they may be wanted to fill up vacancies, or thrown away altogether, as they are so readily propagated, and while young, are much better suited for forcing, than when old. In arranging the whole in the house, the cherries, plums, and apricots require the most light and air, therefore that point should be attended to in their arrangement. The raspberries and currants will grow well in a little shade; and the gooseberries, from their dwarf habit, may occupy the front line, and thus take up little space, and cause no shade. The raspberries may be placed near the back of the house, between the pots or tubs of the other trees, and the currants occupy the middle, so as to be partially under the shade of the larger trees, but not too much to endanger the setting of their fruit. These trees are all to be understood as pruned before brought into the forcing-house, upon the principles laid down for trees in the open air.

Supposing the house now to be in readiness for forcing about the first of the month, proceed by making fires so moderate for the first ten or twelve days, that the thermometer shall not exceed 50° , and kept to that temperature throughout the day, by admitting a plentiful supply of air; after that time, increase the temperature gradually to 55° , at which keep it, as near as possible, during the remainder of the month. If there be much sunshine, it may be now allowed to rise as high as 60° or 65° , but upon no account allow it to pass that temperature. Large portions of air should be admitted to bring on vegetation regularly, on which depends, in a great measure, the success of the crop. In forcing any of the fruits under consideration, there is much less danger in having the temperature low than

otherwise. It should be an object of the forcing-gardener at all times to allow a few degrees of rise during sunshine, and towards the afternoon of each day; then to throw open the lights of the hot-house, to keep the temperature throughout the day equal or below that of the night; yet the following is too generally the case: fires are kept up during night, and the heated air confined so as to exceed the temperature throughout the day, whereas the reverse ought to be the case. The nearer we approach to nature in the regulation of most artificial temperatures, the more likely are we to be successful.

Plentiful supplies of water should be given to the plants, particularly over head, with the garden syringe, and the house should be steamed every night, by pouring water upon the flues, or by other means, so as to keep up a moist temperature, which will greatly promote the swelling and breaking of the buds. As the trees begin to break into wood, they should be supplied with portions of liquid manure to their roots; there is no method of manuring plants in pots so convenient nor so effectual.

Where a regular cherry-house is wanting, we would recommend a simple structure for the forcing of cherries, apricots, plums, and figs. Supposing, as has been directed already in planting fruit-trees against walls, that the different sorts of fruits have been planted by themselves, we would select a portion of a southern wall, already furnished with trees in a full-bearing state, of the sorts wished to be forced, and against one or more trees, erect a portable-house or glass-case, which if the walls be furnished with flues, or built hollow, can be heated sufficiently; or if they have not been so built, then a temporary flue may be introduced through the wall from a furnace behind, and carried along the surface of the border within the house, elevated a few inches above the surface, and made to pass through the wall again, and the smoke carried off by means of an upright flue carried up behind, and equal to the height of the wall. The rafters which support the sashes should be fixed to the top of the wall by means of screw bolts, which may remain fixed in the wall, and made to pass through the end of each rafter, with a nut to keep them secure; these rafters need not be heavy, as the weight of the sashes will

chiefly rest upon the wall-plate, which will be supported upon blocks or piles driven into the ground at equal distances, say one under every other rafter, and the space between the surface of the ground, and such wall-plate to be boarded closely with well-seasoned inch deal; which deals should be fixed to the piles, by means of screws so constructed as to be readily taken out, to allow the whole to be taken to pieces when not in use. The height of this boarding may be from one to two feet, which will elevate the sashes so as to be opposite the best part of the wall, as well as to admit of their being occasionally taken down to admit air. Should the sashes not be of sufficient length to reach from this plate to the top of the wall, a part of the top of the rafters may be covered with seasoned boarding, similar to the front; but, in the case of this upper boarding, it will be necessary to place the boards in an imbricated manner, to preclude the rain from getting in. The sashes need not be more than three or four feet distant from the wall at bottom, as all that is necessary to be done to the trees can be done by a careful person inside, or from the outside in fine weather. The materials with which such a frame as this is composed should be got up in a neat and portable manner. The angles at the ends need not be glass, they should be boarded up, and at one end a small door for the admission of air, as well as for examining the trees, state of temperature, &c. Several of such frames as this, or where better can be devised, will be extremely useful in every garden, and the sashes may, when not in use for such purposes, be employed in ripening melons, cucumbers, &c.; and in autumn such frames will be of much use in accelerating the ripening of late peaches, grapes, &c., upon the walls, and for preserving grapes, that may have ripened, for a great length of time. The many useful purposes for which portable structures or glass-cases may be used are not yet sufficiently appreciated, we expect to see the time when they will be found in every garden.

In glass-cases, similar to these, cherries have been successfully forced by Mr. Torbron, one of the best practical forcing-gardeners of the present day. The temperature and general management of the trees in them will be exactly such as is already laid down, only, if it be necessary to introduce the

heat by means of flues built upon the surface of the border within the frame, the border should be covered with rotten dung two or three inches thick, and be carefully supplied with water, to keep it in a proper state of moisture; and the border in front of the glass-case should also be covered with rotten dung, and occasionally watered, but this watering of the external border will depend upon the state of the weather: care must be taken not to be too profuse of water until the fruit be fairly set, as it is apt to drop; indeed, we are never sure of a crop of cherries until the stones are formed in the fruit. If a case, such as this, be placed over a space of wall occupied with plums, and another over a space occupied with apricots, and another of figs, we may expect, under ordinary good management, a plentiful crop of all these delicate fruits at an early season, and at much less expense, than by any other means whatsoever. The same trees may or may not be forced the succeeding year; if they be allowed a year to rest, their future crops will be benefited; but if forced every year will become habituated to the change of season as it were, and will, under ordinary good management, continue fit for forcing for several years. Since the beneficial effects of heating by hot water, as recommended by W. Atkinson, Esq., have been acknowledged, portable structures may be readily heated, by a complete set of portable hot-water apparatus, which may be removed annually at no great expense, and applied to heat that part of the wall intended to be forced; and for forcing cherries we would say, that it is the best mode of heating that can be applied, from its giving out its heat more gradually, and the almost impossibility of over-heating the air of the structure.

The following remarks are from the practice of Mr. Flintemann, gardener to the King of Prussia, upon forcing cherries. The Double May is the sort chosen, and is grafted upon the common wild-cherry of the woods. They are planted in good garden-mould, with a mixture of vegetable mould, and are one year establishing previous to being forced. During this time they are placed in a sheltered situation, and fully exposed to the sun; during winter their roots are protected from frosts by being covered with litter.

The following interesting mode of treatment is practised, for the purpose of inducing in the trees a disposition to form blossom-buds. The spring subsequent to their being planted, the blossom-buds are taken off as they appear, and by the end of June, or beginning of July, such shoots as have formed have their points taken off, leaving not more than six buds; these buds, by this practice, become all blossom-buds.

The exposing them to a degree of cold, previous to their being taken in to force, equal to fourteen degrees is considered a leading feature in this practice, as well as thinning out the flower-buds to a very considerable extent, often to three-fifths of their whole number. We may here observe, that the thinning of the blossom-buds is much too little attended to by English forcing-gardeners, and it is not going too far to say, that those upon the open walls should also be considerably thinned. In the Prussian royal gardens, the temperature commences at or about 46 degrees, and during their growth, the trees are frequently sprinkled with water, rendered moderately warm. The roots also are watered with warm water, of a temperature equal to that of water when boiled, mixed with an equal quantity of cold. As soon as the plants are placed in the cherry-house, they are well soaked with this water, which watering is continued till within fourteen days of their coming into bloom. The roots, previous to their being brought into the forcing-house, are kept perfectly dry for some time. When the trees are coming into blossom, the watering over head is suspended, but the stems and principal branches are kept moist by rubbing them two or three times a-day with a wet brush. While the trees are in blossom, the temperature is gradually raised to 67 degrees. Air is freely admitted, and during bright sunshine, the houses are shaded. In admitting air during cold and windy weather, pieces of gauze are placed over the parts opened, to break the keenness of the air. The temperature of the house is kept steadily between $54\frac{1}{2}$ and $65\frac{1}{4}$ degrees, from the time the fruit sets until it has considerably swelled previous to stoning; but while stoning, it is lowered to 59 degrees for two or three weeks during this crisis. Shading is particularly attended to during sunshine, a practice that

would be rather novel in this country, but probably done from a view to lengthen the period of the flowers remaining in perfection, and thus giving a greater chance for the office of impregnation being performed, which we suspect is not sufficiently attended to with us, particularly in the early forcing of stone fruits. We have often observed, that when very hot days occurred while the cherry-trees are in blossom, even on the open walls, that the blossom soon fell and a light crop followed, and this too in a particular degree, when the cherry-trees were unusually covered with bloom. These two points are leading features in Mr. Flintelmann's practice, namely, thinning the blossom-buds, and shading during their expanded state, both of which undoubtedly tend to give additional strength to the parts of fructification of those flowers, which are left. During the period that the fruit begins to swell after stoning, till they are ripe, the temperature is raised to 65 degrees, and during this period, both air and sunshine are freely admitted, to color and flavor the fruit. The same intelligent foreigner has successfully used rotten saw-dust, or chopped moss, to which he adds some unburnt lime pounded, as a preparation in which to plant his trees intended for forcing. Saw-dust we are not aware has ever been used in this country as a matter in which to plant fruit-bearing trees, neither has it, as far as we know, even entered into compositions for that purpose, being considered chemically as mere woody fibre; little good has been expected from it as a manure, or affording food for plants.

Moss has been brought into notice by Mr. Street, in a communication to the Hort. Soc. and Gard. Mag., as "possessing a power to some extent of regulating temperature, more than most kinds of earth; that is, it resists extreme heat and extreme cold, and is not apt to lose all moisture suddenly, while it discharges a superfluity of moisture. It does not act like some rich earths, giving out all its virtues at first, but becomes gradually richer in decay, when a fresh supply may be added in the same space of pot room." Those interested in this curious experiment should consult the analysis of woody fibre by Gay Lussac and Thenard.

FORCING FIGS.

Few houses are built expressly for forcing this fruit. They are generally forced in the cherry-house, or planted upon the back walls of vineries or peach-houses, and trained in the fan manner to the wall, or more generally to a trellis; but as figs, under all circumstances, thrive better as standards than otherwise, they are also found to succeed better as such in forcing-houses, and to succeed pretty well if planted in the middle of vineries, as dwarf-standards, under the shade of the vines, and in this case often ripen both their spring and autumn crops. We would consider it the most eligible method to have them in boxes, or large pots, as by this means, they could be removed at pleasure to the most convenient situations in the houses. But where there is the convenience of a cherry-house, it will answer equally well for both plums and figs, and a house of ordinary dimensions will, under good management, afford enough of all these fruits for a large family.

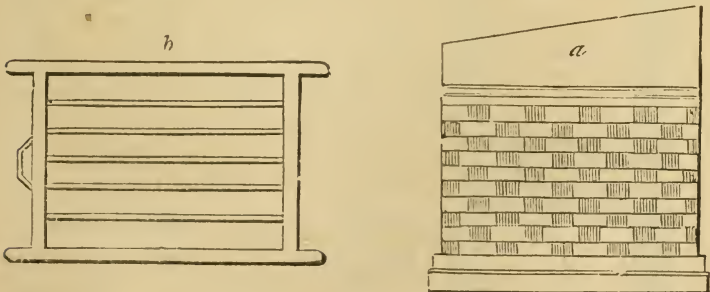
Figs, in whatever situation, are very subject to be attacked with the red spider. Care must be taken to use the garden-engine, or Reid's syringe, with force upon the foliage, and when the fruit begins to ripen, as it would be detrimental to the flavor of the figs to be much watered, recourse must be then had to a painter's brush, with which to brush the leaves, but this must be carefully done, as the leaves of the fig, like those of the vine and melon, are extremely delicate in their young state, upon which the spider is most likely to commit its ravages. When the leaves become older, and of course more robust, less care is necessary. Few other insects annoy the fig, except the coccus or scaly insect, which will do little injury to the trees, and may be rubbed off with the finger, or left on till the fall of the leaves, and then washed off with soap and water. The red spider may also be suppressed by sprinkling the flues, when they are pretty hot, with flour of brimstone, or a little of it may be sprinkled on the leaves with good effect.

FORCING CUCUMBERS AND MELONS.

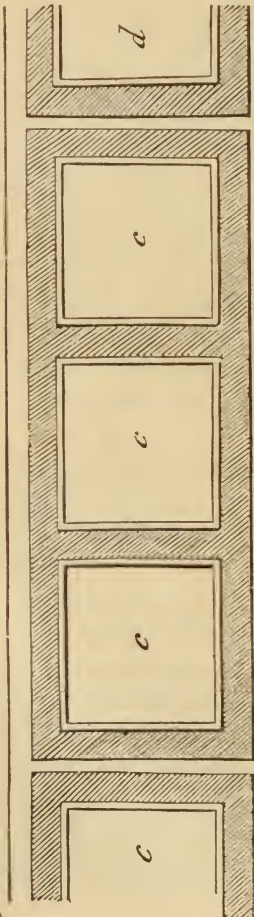
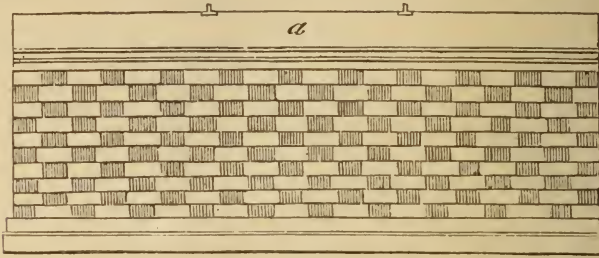
The production of these fruits at an early season of the year is an object of considerable emulation amongst gardeners, and

many contrive to cultivate the former of them all the year round. As their general management is so nearly alike, we will continue to detail their culture under the same head. The beginning of this month is a very good time to commence the rearing of these plants for an early crop, but for general purposes, the first of February, or even the first of March, will be more suitable. It has been observed by a practical writer upon this subject, that beginning before the first of this month is striving hard against the stream to little purpose. If preparations were made the end of December, or the first week in January, so as to sow the seeds by the second or third week in the month, the success will be generally greater than by sowing a month, or even six weeks earlier. But when cucumbers are particularly wanted by a family during all the winter months, then it is much better to cultivate them in large pots or boxes in the pine-stove, or else in a separate department, in which French beans, strawberries, &c., may also be grown with tolerable success during the whole of the winter; but under common frames or pits, heated only by means of fermenting dung, the chance of success will be precarious. Cucumbers and melons are forced in a variety of ways; some gardeners preferring common hot-beds, others dung-pits in their different modifications, and not a few have of late years grown them in pits heated by steam.

Many varieties of pits have been recommended in which to grow these plants, that of M^r Phail is amongst the most ancient, and has been in very general use, and may be described as consisting of two parts; the frame (*a a*) and lights (*b*),



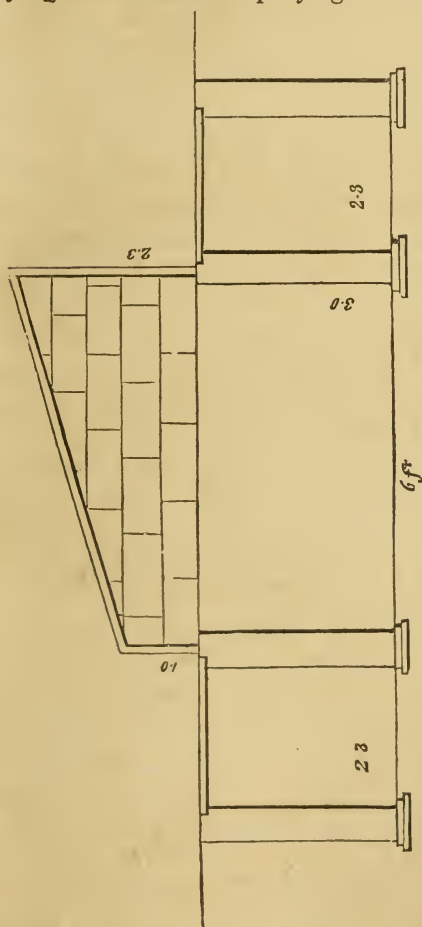
which are of wood, and differing nothing from those in common use for growing these fruits; in the second part is the



basement (*ccccd*), on which the frame is placed, which are flues of brick-work, having the side or outer walls built open, as shown in the section, &c.; round these perforated walls, linings of hot dung, or dung and leaves are placed, the heat of which enters the flues, and heats the mould (*ccc*) in which the plants grow. The chief advantages of this pit are, that the dung requires no preparation before using, and consequently none of the heat is lost, whereas in most other pits, the dung requires to be considerably fermented before it can be with safety used, for fear of injuring the plants by overheats, or the admission of rank steam, neither of which can be the case where this pit is used. It may, however, be objected to, on account of the first expense in the erection, and the greater quantity of dung required to produce a sufficient heat, owing to its having to find its way through the sides and covers of the flues before it can reach the mould in which the plants grow. But where neatness and order are looked to,

pits of any sort are preferable to dung beds, and this one, if partially sunk under the ground-surface, or surrounded with a neat wall as high as the perforations in the side walls, will have a neat and respectable appearance.

The Edmonstone pit is calculated either for the cultivation of melons, cucumbers, or young pines, and may be understood by a glance at the accompanying sketch.



Its length is eighteen and a half feet, and six feet in breadth; the height of the back wall is five feet, and that of the front one, three feet nine inches. The heat is supplied by linings of hot dung, which surround the pit three feet deep and two feet three inches broad, and is separated from the surrounding ground by a nine-inch wall as high as the ground-surface, which wall is finished with a course of hewn stone on the top. The linings are covered with a wooden cover, which is supported by the above wall and front wall of the pit, and which prevents the dung of the linings from being chilled by rain or cold, and completely hides all that is so offensive to the eye in

ordinary hot-beas and pits where the lining is exposed. This pit is in very general use in Scotland, and is described in a communication in the *Cal. Hort. Trans.* To these may be

added the early and late forcing-pits, invented and much used by W. Atkinson, Esq., and which are intended for general purposes, either for growing young pines, melons, cucumbers, or forcing flowers, strawberries, &c. The latter will require no farther description than that of the engraving, which is in itself sufficiently clear, but the former differing in a material point, will require a little explanation.

The danger often attending the admission of rank steam into forcing-pits led to the invention of the accompanying one, and it has been found in practice to answer every expectation. This pit is sunk under the ground-level, as shown both in the section and elevation, and is heated by linings applied in the usual way round the sides and ends. The heated air enters through the back-wall between the open courses of brick-work, but the steam is prevented from entering, at the same time, farther than the cavity (C, *See Plate*), which is formed by placing large slates parallel with the walls, and a few inches from them. The heat from the front lining enters the front wall, which is composed of brick pillars, the spaces between them being filled with a large slate, through which sufficient heat penetrates, while the rank and noxious steam is kept out. This heat is intended to warm the atmosphere of the pit, and finds its way into it through the cavity (*d*), which is left open at top. In the process of filling the body of the pit, sometimes mould, or other matter, may fall into the open cavity (*d*), but this is easily got out by introducing a narrow hoe at the ends, where a provision is made for that purpose, by taking out the moveable stone or tile at (B). The advantage of this pit is manifest: like those of M'Phail, rank dung may be safely used, but it has this important advantage over such pits, that a much less quantity of dung is required to heat them. We have seen this pit in operation, and nothing could answer the purpose better for which it was intended. Like the pine-pits recommended by Mr. Aiton, this pit also is furnished with a gutter in front at (E), for preventing the water falling into the front linings, and which, without such a provision, would chill the heat in them, and in continued wet weather render it almost impossible to keep up the required temperature.

The following novel method of obtaining a crop of early cucumbers, fit to cut in January, is communicated by Mr. J. Reed, of Bristol, in the Gard. Mag.; and to those who have the opportunity, it certainly merits a trial: "On or about the 20th of September, cucumber seeds, of an approved or known sort, were sown on a moderate hot-bed in the open air, and treated in the usual manner till they were ready to ridge out. This generally happened about the beginning of November, at which time the shoots of the vines, in an ordinary vinery, were withdrawn from the house, and a dung-bed formed on the floor in the usual way. After placing the frame and mould on the bed, it may be left without the lights till the rank steam has passed off. After this, the plants being placed in the hills, and the sashes put on, the following are the leading features of management during winter. Make fires in the evening, so as to warm the air of the house to from 56° to 60° , and in very severe frosts it may be raised to 70° . In the mornings of the coldest weather and shortest days, make a strong fire, so as to raise the heat to nearly 70° when the house is shut up. About eight o'clock, and from that time to half past nine, give plenty of fresh air, by opening the front sashes and top-lights, after which, and during the remainder of the day, give plenty of air to the cucumbers, by tilting the sashes in the usual way. In mild weather, and during sunshine, the lights may be taken entirely off the cucumbers for some hours each day; and immediately after forming new linings, the top-lights may be taken down a little all night, to permit the escape of any rank steam. The advantage of this mode of growing cucumbers during winter, is the comparative certainty of an early and good crop at one-third of the trouble and expense of the common method out of doors. The expense is lessened by no covering up being required, and by all the labor attending the renewal of linings, &c. &c., admitting of being done in wet weather. The vines may be introduced in the beginning of March, (a very usual time of commencing forcing for a regular crop,) and will break regularly in consequence of the genial steam of the dung. In April, the beds may be removed, as by that time the shade of the vines will

be too much for the cucumbers, and by that time plenty of cucumbers will be in use from the beds out of doors."

We would suggest the necessity of keeping the glass, both of the roof of the house and the sashes of the frame, as clean as possible, as the rays of light will have to pass through both. The nearer that the plants can be kept to the roof of the house, the more light will they enjoy, and be less liable to be drawn up weakly, the only objection we see to the process.

In preparing to cultivate cucumbers and melons, either upon beds composed of dung only, or of fagots to be heated by means of dung-linings, it will be necessary, in the first place, to prepare dung wherewith to form a seed-bed. For this purpose, such a quantity of good fresh dung should be procured as will be sufficient, after being well fermented, to form a bed about five or six feet wide, and three and a half or four feet long, and about five feet high at the back, and four at the front, upon which to place a one-light frame, which will be sufficient for the purpose of rearing seedling cucumbers and melons for any ordinary family. The dung for this purpose should be under the process of fermentation for a sufficient time to allow the fiery heat and rank steam to be fairly exhausted, during which time, it should be frequently turned over, and well mixed at each turning, so that the whole body of dung will heat equally when put up into the bed; this is of much consequence, as if not done before the beds are made and the seeds sown, it cannot be done afterwards, independently of which, the heat will be more permanent and equal. The length of time that the dung should be thus in a state of preparation, must be determined by the state of the weather, and the quality of the dung. In building the seed-bed, let the dung be well shaken with a fork, and regularly laid up one course above another, and well beaten down with the back of the fork, but not trodden with the feet. When it is of sufficient height, place the frame upon it, and put on the glass, which may be covered up with mats, either single or double, which will help to draw up the heat. When this is sufficiently up, level the surface of the bed, and to guard against

accidents, from too much heat or noxious steam, let the whole surface be turfed over, the turfs being laid with the grassy side undermost, and beaten well with a spade or turf-beater, to render the joints as close as possible. Then cover the whole with any light mould, or rotten tan, to the thickness of six or eight inches, upon which to place the pots with the seeds. This covering should be as dry as possible, as it is much easier at this time to water, if too dry, than to render it dry, if too wet, the sun at this season having little power to evaporate any superabundant moisture. The seeds may be sown in small pots, or shallow pans, filled with rich light mould, and covered to the depth of two inches, and placed upon the surface of the bed. As the heat rises, the pots or pans may be either plunged deeper, or still kept upon the surface, accordingly as the heat of the bed may be more or less strong. The bed, from this time forward, must be regularly covered every night with mats, either single or double, according to the state of the weather and the heat of the bed. No air need be admitted, until the heat in the bed begins to rise and the steam begins to appear; but, upon the appearance of steam, and the young leaves of the plants, care must be taken to tilt up one end of the sash, less or more, to allow the steam to pass freely off: this must not only be attended to during the day, but during the night also. If the air be very frosty, or the winds cold, then the ends of the mats should be allowed to hang over the opening, that the air may be broken, and not allowed to blow with force upon the tender plants. Throughout the day, when the light is tilted up for the admission of air, a thin piece of mat should be hung over the opening, for the wind to pass through before reaching the plants. In covering up at night, care should be taken not to allow the ends of the mats to hang over the sides of the frame, particularly after the linings may have been applied, for when this is not attended to, it often occurs that the noxious steam from the dung will be so confined that it cannot escape, and be thereby conveyed into the frames, and destroy the plants.

The temperature of the seed-bed should be kept up to from 65° to 75°, but a few degrees of difference are not of that importance which is usually attached to it; indeed, the plants will

not hurt in any temperature varying from 60° to 80°, provided the transitions from both extremes do not occur too frequently, and at the same time too suddenly. After the seeds are sown, the bed should be carefully watched, for fear of the mice, which will begin to abound in the frame-ground about this season, and, if not kept down, will be very destructive, both to melon and cucumber-plants. When the seeds are sown, cover each pan or pot with pieces of glass, or a bell-glass, taking care to remove it as soon as the young leaves begin to expand. As the plants appear above ground, if the mould in the pots appear to be dry, give them a little water that has stood for some hours in the bed, or which has been brought to a temperature equal to that of the bed, or nearly so; but be careful not to give much at a time. If the heat in the bed becomes too violent, then, if the pots or pans have been partly or wholly plunged, draw them up a little, or take them up altogether, and stand them upon the surface until the bed declines in heat; without this precaution, the roots of the plants would be liable to be destroyed by too much heat. As the plants begin to grow, admit air in a sufficient quantity, at all times, into the bed, to guard against drawing the plants up weakly, and remove the mats as soon after sun-rise in the morning as possible, to give the plants as much of its invigorating influence as possible.

If the bed be not placed in a situation extremely well sheltered against cutting winds, it will be necessary to protect the linings with reed-mats, hurdles thatched with straw, or bean-haulm, or such like materials; for, when the wind is allowed to blow violently against the bed, the heat can never be depended upon, and will never be uniform. Sometimes a fine steady heat will be blown out of a bed of such small dimensions in a few hours; and, if not blown out altogether, will be blown from one corner to another, consequently one part will be too cold, while another is too hot, and the plants will be all endangered, and perhaps some, if not all, totally destroyed. In building a seed-bed at this season, it is advisable to make it at least a foot or fifteen inches larger than the frame; this allowance can be readily cut off, when it is found necessary to apply linings; and if, in forming the bottom of

the bed, there be laid a foot or eighteen inches of branches or fagots under the dung, it will render the bed less liable to be injured by damp.

When the plants are a little advanced, with the seed-leaves about half an inch broad, which they should be in five or six days after their first appearance, they are then fit for being transplanted into nursing-pots, to acquire sufficient strength to be afterwards planted out on the bed where they are intended to produce their fruit.

Before proceeding to plant them into nursing-pots, it will be necessary to have the pots and a sufficient quantity of rich dry light mould, chiefly decomposed dung from an old hot-bed, and vegetable mould well decomposed, carried the day before it is to be used into the frame, that the whole may be of equal temperature, for the young plants to experience as slight a check as possible in their removal from the seed-pot to that of the nursing or succession one, which pots should be about three and a half or four inches diameter at top, and as much in depth. Let the pots be filled about one-half with the earth, then turn the young plants carefully out of the seed-pot, breaking the fibres as little as possible. Place three plants in each pot close to the sides, so that their young leaves may rest upon the top of the pot, then cover their roots with the mould, carefully rubbing it fine with the hands, and filling the pots nearly up to the brim. The deeper the young plants are placed in the pots now, the better; for they will push out roots all the way up the stem from the original roots, as far as the surface of the mould in the pot. The mould should be dry, and, in filling it in, not by any means pressed, but put in quite loose, and the whole should have a gentle watering over-head with a fine-rose watering-pot, which should be constantly kept in the frames at this season full of water, which should be of a temperature, as near as can be, to that of the atmosphere of the frame. This being done, stir up the surface of the bed and replace the pots, either plunged or half-plunged, according to the state of the heat in the bed. Keep up now a brisk heat, by means of linings round the sides of the bed, so that the temperature within the bed may be kept to about 60° or 65° in the night, and a few degrees of a rise

in sunshine. The great objects to guard against at this season, are too much rank steam, and an excess either of heat or cold. Air should be admitted as freely as the weather will permit, that the plants may not be drawn up too weakly. The bed should not only be examined morning and evening, but also once or twice throughout the day, until the plants get a little stronger; if the roots be in danger of being destroyed by too much heat, take the pots up a little; and if too cold, plunge them a little deeper into the bed. As soon as the first seeds are above ground, a few more should be sown as a substitute in case of accidents, and this second sowing should also be succeeded with a third, and so on. In ten or twelve days after this seed-bed is put up, it is probable that the heat will be beginning to decline; this should be watched for, and, upon the least appearance of it, a lining of well-fermented dung should be applied to one or more sides of the bed, as may be judged necessary; this lining should be protected in the same manner as has been directed for the bed, by covering it round with reed-mats, long littery dung, or bean-haulm, which will not only keep the bed and lining perfectly dry, but will also prevent the wind from blowing the heat out of it. The lining thus put round, should be from fifteen to eighteen inches thick, and a few inches above the bottom of the frame. It should not, however, be built either too thick or too high at this time, lest it throw too much heat suddenly into the bed, and thereby endanger the plants. The inside should be examined, and a little fresh dry mould laid all round the inside of the frame, to prevent the admission of too much steam; for although a certain portion of steam is necessary for the welfare of the plants, so as to keep up a moist warm atmosphere, yet too much would be attended with danger; upon examining the bed in the morning, a sufficient quantity of steam should be found to appear like a fine dew all over the plants, and hanging in beads upon the under side of the leaves. In ten or twelve days after the first lining is applied, it may be necessary to apply it to the remaining sides, which will revive the heat of the whole, and if covered over also with any dry littery matter, to resist the cold cutting winds, and cold rains or snow, it will keep up a sufficient heat for some time longer.

By the end of this month the plants will be fairly established in their nursing-pots, that is, if the seed were sown about the first of the month. As soon as they have formed two rough leaves, the bud that is to produce the shoots or runners will appear between the two leaves; this embryo shoot should be taken out, either with the point of a knife, or carefully pinched out with the finger and thumb, but so as not to injure the leaves of the plants. This shortening, or stopping, as it is called, will render the plants more stocky and strong, and will cause the emission of a number of other shoots, which will be more prolific, and they in their turns, when stopped, will not fail to show plenty of fruit; whereas if this first shoot were allowed to proceed without stopping, they would probably run two or three feet without showing fruit, and would be both sterile and slender. Some gardeners, however, consider this shortening or stopping the plants in this young state to be a matter of little consequence, and allow them to run to three or four joints before they stop them.

FORCING STRAWBERRIES.

Strawberries are brought to early perfection in every description of forcing-house, pit, or frame, with more or less success, which, in a great measure, depends upon the plants being properly prepared before bringing into the house, of proper sorts, upon the soil being suitable, and during their growth being bountifully supplied both with air and water; the latter in perhaps more abundance than for almost any other plant which we force. Many sorts of strawberries force well, but the Alpines, Bath Scarlet, Grove End, Scarlet, Roseberry, and Common Scarlets succeed best, and are most generally chosen for that purpose.

Young plants, that is, runners of the preceding year, are almost universally preferred, and are potted in April, two or three plants in a pot of eight inches diameter, and six inches deep. These are plunged in the earth all summer, giving them plenty of water and keeping them clear of weeds, where they remain till taken into the forcing-house or pit. But the runners of the same year, taken off in July, and planted in

pots of the above dimensions, are found often to succeed well; these latter should be plunged in the open borders up to the brim, being shaded after planting for a few days, till they have struck root, and afterwards watered as they may require till autumn, when the pots are partially covered with rotten tan, or long litter, to prevent the pots from being broken by the expansion of the damp mould within them; they are thus left till spring, when the covering is removed, and the surface of the pots is stirred up; part of the mould is also removed, and replaced with some very rich loam, highly manured; the ground also among the pots is stirred up to clear it of weeds. During summer, the flowers, as they appear, are carefully cut away with a pair of finely pointed scissars, as soon as they appear to be forming, this is practised as long as they continue to appear; the pots, and ground round them, being kept clear of weeds and frequently watered. Here they remain till they are wanted to remove into the house or frame. For a large family, not less than one thousand pots will be required to be always in a state of preparation, for the purpose of keeping up the supply; and, when taken in, such as are of a weakly appearance should be rejected.

Alpines are found to succeed best when raised from seed sown in January, (or before,) in boxes or large pans, placed in a mild heat. In spring they are gradually hardened, and are potted off in May, in pots of the same size as those above-mentioned, placing three or four plants in each. During summer, they are kept in a cool and shaded situation, plunged up to the brim or nearly so, and, if the weather be dry, are supplied with water, and sometimes with liquid manure, which is applied to the surface of the pots, taking care not to spill any upon the foliage. They are, likewise, kept clear of weeds, and in October, when they are coming into flower, they are put under shelter. Cold frames, if such can be spared for them, are preferable to any thing else; placing the pots closely together, to occupy as little space as possible, and covering the floor on which they stand with coal ashes, to prevent, as much as possible, the entrance of worms. During their stay in this situation, if they be once or twice watered with lime-water, the worms will be destroyed. They are to remain here till

required to be removed into the forcing-house or pit. Such as are the earliest and fullest in flower, should be removed in November into a slight hot-bed prepared for them, and if they remain here till their fruit be set, they may be removed into the pine-stove or succession-house, and placed upon shelves erected as near to the glass as possible. These shelves are generally suspended by wires, or slight brackets of iron, fixed into the under side of the rafters of the house, directly above the footpath, or such parts of the house, as the water spilt in watering the strawberries will not fall to injure the pines. Each pot is placed in a pan, both to prevent an unnecessary loss of water, as well as to keep the roots moist and cool; strawberries, by this means, may be had during the winter months with tolerably good success.

But for a more general crop of this esteemed fruit, the beginning of January; the beginning and middle of February; the beginning, middle, and end of March are much the best seasons for beginning to force. At these seasons, the plants in pots still remaining in the open borders, covered with litter, rotten tan, or any preferable substitute, and such Alpines as still remain in the cold frames, particularly such of them as have not come into bloom, or such as have had their flowers cut out of them, should now be brought in, in regular rotation. The number of pots introduced at once being in proportion to the stock potted, or the demand for the fruit.

The pots should be well cleaned, and all dead or decayed leaves removed; the surface-mould in the pots carefully stirred up, and a part removed, the pots should then be filled up with rich yellow fresh loam, well manured with rotten dung. Place each pot in a pan, and give them a little water, if at all dry; and once or twice during their period of forcing, give them a watering with the drainings of the dunghill, or water in which sheep or cows' dung has been steeped. For the general crops of strawberries to be forced, if there be the convenience of frames and dung, they will be much improved by being kept in them till the fruit be set; but if there be the convenience of a cherry-house, or peach-house, beginning to be forced, a few weeks in either of them will be a good situation for them. Indeed, the temperature of the cherry-house is the

most natural for the strawberry, and in such a temperature the crops will be more certain. They may be removed to the pine-stove to ripen off, and thereby be improved in flavor, at the same time that they make way for a succession crop being brought into the cherry or peach-house. They may be also successfully forced in a flued pit, or in a pit warmed by external linings of dung, or dung and leaves, or they may be grown well in common frames heated by the same means, only, in this latter case, they are attended with more trouble. Where they are to be extensively forced, a range of pits will be found the most convenient and suitable place, as they can then be plunged into a mild bottom-heat, which, if not too warm, will keep both an equality of temperature and moisture round their roots, which is of the utmost consequence to all plants of rapid growth in pots. In such compartments, a regular temperature can be kept up, varying from 50° to 55° , and not to exceed 60° until the fruit be fully set; after that, the temperature may be allowed to rise gradually to 65° and 70° . During the growth of these plants, while in blossom, and while swelling their fruit, an abundance of water should be given them, and continued until swelled to their full size; after which, it should be gradually withheld, so as not to injure the flavor of the fruit; but this change of moisture, like that of temperature, should not be suddenly effected, but withdrawn by degrees. Nothing is so injurious as those sudden changes of temperature and moisture, which we see so frequently practised.

In whatever way strawberries are forced, it is of material consequence to them, that they have air admitted to them in large portions, particularly while in flower and while the fruit is setting. Hence the advantage of pits for them, where they can be managed, as far as regards this important object, as well as suited with a temperature to their respective stages of growth. Strawberries, unlike most other perennial plants, will not force well above one season; but this is an object of little consequence, the means of always procuring young plants being so easily attained; and, as such is the case, a fresh supply should be prepared annually.

When the crops are gathered of those brought earliest into fruit, they should be thrown away, but such as have been forced

into fruit at a more reasonable season, should, after the crop is gathered, be carefully taken out of the pots, and plunged, with their ball entire about their roots, in a sheltered border, where they will, particularly the Roseberry, Grove End, and common Scarlet, produce a good crop in the September following, when other strawberries are scarce. The rains of the latter end of July, and beginning of August, are extremely favorable for the growth of the fruit, which cannot fail to be an acceptable addition to the Alpine, which is the only strawberry in fruit at that time. Where provision has not been made, by potting a sufficient number of young plants, then recourse must be had to such as are older. In this case, young plants established in the open ground, during the previous season, may be carefully taken up in autumn with good balls, and potted in pots of dimensions suitable to the sizes of the plants, and, after being well watered, may be kept in reserve for removing into the forcing departments when wanted; but in this case, it will be attended with more success, if they be not brought into vegetation till March, or, at all events, the middle of February.

To prolong the season of this fruit as much as possible, a variety of sorts should be potted at different times, and plunged in different situations, and as they begin to show a disposition to bloom, should be picked out and removed to temperatures agreeably to their habits and state of growth. By such means, where there are many forcing departments, this useful fruit may be had at all seasons of the year. The Alpines appear best suited for a late crop in a cold shaded situation in autumn, and are amongst the best for bringing into a state of vegetation earliest in the hot-houses or pits. The Scarlets are found to bear a greater degree of heat than any other, but do not set their fruit so freely in the short and cloudy days of winter as the Alpine.

The soil in which strawberries to be forced seem to thrive best, is a strong and very rich loam, well manured with rotten dung, and, in potting them, to place two inches of rotten dung in the bottom of the pots.

FORCING ASPARAGUS.

Asparagus was one of the first culinary vegetables accelerated by artificial means. The London market was supplied, before the middle of the seventeenth century, with forced asparagus, at an early period of the year; and it is still brought to Covent Garden market during the winter, in greater perfection than to any other market in the world. It is brought to perfection in a variety of ways, from the beginning of November until it comes in, in the open ground. Asparagus requires a much less degree of temperature to produce it in perfection than almost any other vegetable, and is much sooner injured by a strong heat, particularly if attended with much steam. In preparing dung, therefore, for forming beds on which to place the roots, or for external linings, more than ordinary care should be taken to have it well prepared, that is, by having it repeatedly turned and fermented, until the greatest part of the rancidity of the dung shall have evaporated.

The most general mode of forcing this esteemed vegetable is, by making dung-beds, in the usual way, about three feet high, of well-prepared dung. When they are finished, put on the frames and lights, such as are generally used for growing cucumbers and melons; in this state the bed should remain till such time as it has thoroughly attained a regular heat, and has, what is technically called, well sweated itself. When this has taken place, level and tread the surface regularly over. If there be any apprehension of a violent heat taking place after being thus prepared, the surface should be covered with turf cut thin, and so placed, with the grassy side undermost, that the joints may so unite with a slight beating with the back of a spade, as to prevent the steam from rising into the bed, which would be extremely detrimental to the crop in a state of vegetation. However, unless the heat is suspected to become too strong, by the dung not being properly prepared previously to forming the bed, this covering will be rather detrimental to the heat that is really necessary, by preventing it from rising, and may, in such cases, be dispensed with. The bed thus prepared should be planted with the roots, which are generally taken from the asparagus-bed; in the garden, and, as

was directed in the *Culinary Garden*, should have been covered in autumn with littery dung, leaves, or similar preventives, to keep out the frost.

It is immaterial of what age the roots may be, provided that they are strong and vigorous, and have produced a good crop of strong shoots the preceding season. Some gardeners lay much stress upon the age of the roots, some recommending roots of two years' growth and upwards. We have, however, found strong healthy roots of thirty years' growth succeed equally well with those of four or five years' standing. Certainly, roots above four years' growth, are to be preferred to those under that age.

The roots should be carefully taken up, injuring the long fleshy fibres as little as possible, and removed to the prepared bed, which should, previously to the plants being placed upon it, be covered with a few inches of dry light sandy earth, no matter how poor, rotten tan or loamy sand will answer equally well. When this stratum of mould is laid on, and levelled over the surface of the bed regularly, begin at one end of the bed, and place the roots closely together in regular order, keeping the crowns uppermost, and all of them as nearly level as possible. A bed of three lights, and of the ordinary dimensions, will require not more than six hundred roots, if they be young, but a much less number of old and larger ones will fill it; this must depend, however, entirely upon their size, older ones, of course being larger, fewer will be required, and a frame of the usual size of three lights, will, under ordinary good management, produce a dish every day for nearly three weeks. The roots being thus placed should be covered with some finely sifted light dry mould, and sprinkled first thinly over them, to allow of its filling up the spaces between the roots; after this they should be covered with any light mould or rotten tan, to the depth of four or five inches. The bed being thus finished, should then be covered with the lights. Should the heat become too strong, the glasses may, at any time, if fine weather, be taken entirely off during part of the day, which will allow the rank heat to escape, and, until the buds begin to vegetate, cannot injure the roots; but this will seldom happen, if the dung has been properly prepared before using

If the heat should not come freely, keep the glasses shut down, until it rise and the buds begin to vegetate; after which air should be admitted as freely as possible, and, after the buds begin to appear above ground, if the weather will permit, they should be removed for as long a time as possible each day, or as much air given, in less favorable weather, as can be done without injuring the shoots with frost, in order to give both color and flavor, as well as strength to the shoots; if this be not attended to, the shoots will be drawn up weakly, without color or flavor.

On the continent, attempts have been made to blanch the shoots of asparagus, to render them more delicate. Should this be desirable, the lights may be shaded with mats or other means, to give the desired effect; but with us, the better they are colored at this season, the more they are held in esteem. When the buds are sufficiently grown to be fit for use, they are to be gathered as recommended for gathering this crop in the open air, using every caution not to injure the buds still under ground. The mould should be cleared away with the finger or knife, and the shoot cut out near its bottom, and the mould replaced. It is seldom that asparagus, while forcing in dung-beds, requires much water, the natural moisture of the steam will be found nearly sufficient. Should the bed appear dry, however, a slight watering may be given with a fine-rose waterpot, the water being brought to a temperature nearly equal to that of the air in the bed. When the bed heats violently, a copious watering should be given and repeated, to prevent the roots from being scorched with the heat.

If the temperature of the bed during the night keep to 50°, and throughout the day, by the addition of sun-heat, to 60°, the heat will be perfectly sufficient; when, however, it falls below 48°, and from that to 45°, linings must be applied. Asparagus will grow in a temperature of some degrees higher, but unless forced to accelerate the crop, for the purpose of answering the demand on a particular day, it will be more advisable to keep to the temperature of from 50° to 60° during the whole process.

Asparagus is successfully cultivated during winter in pits heated by steam, fire, or hot water, made to circulate in

pipes through the pits, where dung, leaves, or tan, are not readily procured, or where the pits are placed contiguous to the culinary forcing-houses; and, where neatness and order are attended to, these means will be preferable to dung-beds, as from the nature of their materials and structure, they have no very inviting appearance when placed out of what has hitherto been called the melon-ground, which has generally more the appearance of a dung-yard than any other appendage to a well-ordered garden. Where economy is an object, and plenty of dung to be had, the success will be complete upon such beds with little trouble or expense; but where neatness is more an object, any of the other means will answer equally well, under the same treatment already laid down for dung-beds, only, from the nature of fire-heat by means of hot flues, water must be given to the roots in sufficient quantity to keep the mould always in a state fit for vegetation; not that the roots of asparagus, or any other perennial root similar to it, require that share of food, which is supposed by some to be derived from the mould in which the roots are placed during their period of forcing, but to keep it in a state sufficiently moist to promote that genial atmosphere, in which almost all plants prefer to live, as well as to keep the degree of moisture equal at their roots, and not to have them scorched up by the heat of the flues. It is seldom necessary, for the production of this vegetable, to have recourse to such a degree of heat, as to require the flues to be kept hot so long as to give a sufficiency of moisture to the atmosphere of the pit, by pouring water upon them; for which reason, the necessity of giving it to the mould becomes the more apparent. Pits heated by means of steam can be readily steamed, or kept in a moist state, by allowing a part of it to escape in the pit, at such times as may be deemed necessary; still it may occur that water may be required at their roots also, although in a less degree. The pits heated by means of hot water made to circulate through them in pipes will answer every purpose of the above, and although not yet in general use, will, in all probability, be generally adopted in all forcing-gardens, particularly in pits for the acceleration and maturation of fruits, culinary vege-

tables and flowers, as they are proved to answer every purpose of steam, without the expense of erection or after-keeping.

Asparagus may be cultivated upon beds formed of fagots, heath, or any like material, and heated by means of external linings of hot dung; in such cases, there will be a material saving of dung, as one bed of fagots will produce two or three crops in one season. As soon as one crop is cut, clear off the old roots and mould, and throw them away, they are considered as useless, no leaves being allowed to form, of course no buds would follow, and replace the bed with fresh ones. In using such beds, it is advisable to turf them over, to prevent the mould falling in among the fagots, as well as to prevent the roots from sinking in inequalities, and to keep the roots from being too much dried or burnt by the heat. In whatever way asparagus, or most other plants are forced, too much bottom-heat should be guarded against, and every means used to admit the heat to ascend in sufficient quantity to warm the atmosphere of the bed or house in which they are placed.

Upon the supposition that a bed or pit has been planted about the beginning of the month, another should be got in readiness to be planted in like manner towards the middle, and preparations for a third to be planted towards the end of the month. When a large supply is wanted, a bed should be planted every ten or twelve days, from the beginning of November till the end of March, when the last put up will continue to yield till it be produced in the natural ground.

Cover the frames or pits with mats at night, according to the state of the weather, but remove them always during the day, after the shoots are above the ground.

FORCING FRENCH OR KIDNEY-BEANS.

The kidney-bean, being a native of India, is only had in perfection with us in the warmer months of summer. It cannot be ventured in the open air till all chance of spring frosts is over, and it is destroyed by the first frost in autumn. To prolong the season of this vegetable is a desideratum in most families, who have the means of cultivating it, and the opulent citizens of

London, and other rich and populous cities, are supplied with it by the market-gardeners, who find it to their advantage to bring it to market as early as possible. From the natural habits of this plant, it is well calculated for cultivating in a high temperature, and those who have the means of a pine-stove can produce it in high perfection; more humble cultivators, however, manage to produce it very early upon beds of hot dung, flued pits, &c.

It is most generally cultivated in the pine-stoves, being a temperature exceedingly well suited to it; for which purpose large pots, and more often boxes or deep shelves are placed in these compartments for the reception of the plants, which should be sown in pots or deep pans, as thick as they can be placed together, in light rich mould; but to render the operation of transplanting less injurious to them, the bottom of the pots or pans should be filled with rotten dung pressed closely down, over which a thin stratum of fine light rich mould should be placed, on which to plant the beans. They should be covered two inches with the same rich mould, and well watered. When this is finished, remove them to the shelves of the pine-stove, or upon trellised tables placed over the flues, at that part of the house most remote from the fire. These tables or trellises should stand five or six inches clear of the flue. In a few days they will vegetate, when plenty of water should be given them, keeping them rather moist than otherwise. When they are fairly above the mould, remove them to a situation in the house, where they will be near the glass, and as much exposed to light and air as possible, so that they may not be drawn up too rapidly. This should be attended to throughout their culture, as if drawn up weak and straggling, the crop will be scanty, and the plants sickly. After standing a few days in such a situation, to become stocky and furnished with roots, they are then in a fit state to transplant into the pots or boxes, where they are to remain to perfect their crop. They may be at this stage of growth much strengthened, and rendered more productive, by being planted out into small pots, of the size generally known by the name of small forty-eights, one plant in each pot. They should remain here for a fortnight, by which time the roots will have

multiplied, and the plants have assumed a stocky stout appearance. Upon finally removing them into the pots or boxes where they are to remain, care should be taken to injure their roots as little as possible, and the dung which was placed in the bottom of the seed-pot or pan will be found useful in forming a ball at the root of each plant, by which means they will sustain little, if any check, in their removal. The boxes or pots into which they are finally planted should be filled nearly half full of good rotten dung, such as that from an old cucumber-frame, or some similar to it. If in boxes, they should be a foot in depth, and of such lengths and breadths as are most convenient for the situations in which they are to be placed, so as to take up as little room as possible; and if pots be preferred, they should be nearly ten inches in diameter, and a foot deep. After being half filled with dung, according to the directions already given, cover it with an inch and a half of very rich loam, upon which stand the plants, three in each pot, and about the same proportion in the boxes; fill in with mould, such as is already directed for placing under the roots, till the stems of the plants be covered up to the leaves; or, if they be a little drawn, about half way up their stems, leaving space within the pots for a further addition of mould, as the plants proceed in growth. After planting, they should be supplied with a moderate share of water, brought to nearly the temperature of the house, to settle the mould about their roots. This should be administered to them as occasion requires, keeping them rather damp than otherwise, but not so as to endanger their damping off. This is necessary to keep them free of the red spider and thrips, both of which, particularly the former are very annoying to them, and if not watched carefully, will not only destroy the plants themselves entirely, but will attack every other thing in the house. Water is one of the means of keeping down this enemy, and it should be given them with some force from the syringe; flour of sulphur may be sprinkled over the leaves, either dry or mixed with the water with which they are sprinkled, the strong heat of a pine-stove will ignite the sulphur, and completely destroy the spiders. The thrips is destroyed by fumigations of tobacco. As the beans advance, small branches should be stuck into

the pots or boxes, in order to support the plants; and where they shew a disposition to become climbing or straggling, top them a little, which will induce them to throw out lateral shoots.

The sorts most generally preferred for forcing are, the *Dun-colored*, *Early-negro*, and *Speckled-dwarf*; and, for successional crops, should be sown every fortnight or three weeks from this time till March.

French-beans are also successfully cultivated in flued-pits, in common dung hot-beds, and, in both cases, are first reared in seed-pans or boxes, and when about three inches high, are pricked out for good, in rows across the beds, which are prepared for them, of light rich loam and nearly half-rotten dung, or where it can be had, rich vegetable mould. They are treated, as to watering and supporting, in the same way as if in the pine-stove, watching carefully the progress of the red spider and thrips, which must be subdued by the same means already recommended for those in the pine-stove. The trouble, however, of growing them in hot-beds is such, that few attempt it so early in the season, neither is the fruit so fine nor yet so plentiful, as when produced in either a pit or stove.

The *Early-dwarf white*, from its dwarf habit, is preferred for pits or frames, and so is also the *Early yellow*, and *Early black*, as being next in point of dwarfness; neither of them, however, is so prolific as those recommended for the stove. Great care must be taken to cover every night with mats, or other means more convenient, for a slight degree of frost would prove fatal to them at this season. Their extreme tenderness is not so well suited to the hot-bed frame, where the degrees of temperature are liable to changes, from a variety of causes over which the cultivator has no control, and which he cannot either foresee or resist till it be often too late.

The temperature, in pits or frames, in which kidney-beans are grown, will require to be kept up to 65° throughout the night, and 75° throughout the day, both taken as the maximum. It will be more convenient in pits or frames to accommodate them with air, therefore this should be attended to at all seasonable times. A free circulation of fresh air, plenty of water, and a high temperature, all of which can be obtained

in a pit heated by fire, steam, or hot water, will produce abundant crops of beans. When the plants are in full bearing, they will be much invigorated by having an application of liquid manure applied to their roots, and also once or twice during the growth of their fruit, and even while in blossom.

Kidney-beans are sometimes grown in vineries and peach-houses; in the former they are liable to be too much shaded, and in the latter, the red spider, of which it is difficult to keep them entirely clear would be dangerous to introduce, as the tender leaves of the peach, when once attacked with that insect, are sensibly injured by it; besides, either of these departments is much better suited for strawberries than for beans.

FORCING POTATOES.

This valuable root, although capable of being preserved from one season to another, is nevertheless required in a young state at the tables of the rich nearly three-fourths of the year, and various modes have been tried to produce this esteemed root at an early period of the year. A slight degree of temperature is found sufficient for the purpose; but, like many other exotic vegetables, it is extremely impatient of frost. In the open air, it is one of the first that indicates the temperature of an autumnal night. In cultivating it at this early season, care must be taken to protect it from the effects of a low temperature, by carefully covering with mats every night.

The most general and successful mode of accelerating this crop is upon beds of hot dung. For this purpose, a quantity of dung should be prepared, by repeated turning and fermenting, until all the rankness evaporates; and when in a proper state to build into a bed, it should be put up to the height of three and a half or four feet, and the lights put on. In a few days it will be fit to receive the plants, which should be preparing, while the dung is undergoing the necessary fermentation, by being cut and partially dried, and then planted into boxes or pots in some light dry mould, and placed in any of the hot-houses then at work, or in a cucumber-frame; they will have sprung two or three inches during the time the dung

and bed are preparing for them, and when the bed is judged to be in a fit state for their reception, let a quantity of light mould be placed upon the surface, four inches thick, upon which place the young potato-plants, the roots of which will have made some progress, and cover them up nearly to the leaves with the same sort of mould; it is of no consequence whether it be rich or not, provided it be light and dry; the more sandy it is the better. Place them in rows about ten inches apart, and five or six inches apart in the row. Proceed in this manner till the frame be filled, after which, give the whole a gentle watering and shut down the lights; from this time forward, they will require all the air that can be admitted to them with safety during the day, and carefully covered every night with mats. As may be deemed necessary, refresh them with water, and frequently examine the mould towards their roots, to see that it is kept in a proper state of moisture, without which they would make little progress and produce a scanty crop. The temperature, if kept about the same as has been already directed for the asparagus-beds, will be found sufficient.

After the same manner they may be grown upon beds composed of fagots, and managed as recommended for asparagus.

The names of potatoes are so arbitrary, that it is difficult to name such sorts as may be best fitted for early forcing. The kinds generally used by us, during our practice, were the *Early Ash-leaved*, *Early Cockney*, and a sort much cultivated round London, known by the name of *Fox's Yellow Seedling*, after a person of the name of Fox, a celebrated grower of that vegetable.

Potatoes, if not improved by being transplanted, are evidently not injured by that process; we have uniformly, for many years, grown them to the height of three or four inches in pots or boxes, placed in the forcing-houses or early melon or cucumber-frames, and afterwards transplanted upon a bed prepared for them, as noticed above; and when circumstances prevented that mode, we adopted that of springing them in a basket or box mixed with mould, and afterwards planted out upon the beds where they were to remain. This we have also done with our earliest crops, planted out in the open borders,

hardening them by degrees to stand the weather in April and May, with a little protection at night.

The forcing of potatoes at an early period of the year has been noticed by few writers upon horticulture, until the appearance of the Transactions of the Horticultural Society; we therefore will make a few extracts from that voluminous work, which, from its size and the richness of its embellishments, however creditable to that body, is certainly from those causes beyond the reach of readers in moderate circumstances.

Mr. Knight cultivates potatoes upon hot-beds in the following manner: "The varieties of potatoes," he says, "which are well calculated for early forcing, begin to vegetate before Christmas; and it is of consequence to preserve the germes and roots first emitted from injury, where a crop of good potatoes is required before the end of May. I therefore plant my potatoes in pots of about six inches in diameter in January, (a single potato in each,) and the pots are then placed in the ground, and covered with litter to protect them from frost, and in this situation they remain till the hot-bed be ready to receive them. In the mean time, the excitability of the plants is not at all expended, on account of the low temperature in which they vegetate; and, therefore, when plunged into the hot-bed, they instantly shoot with excessive rapidity, and in a few days begin to generate tubers. One stem alone should be suffered to grow in each pot, for where more remain, the tubers are smaller, and the crop is not increased in weight. When the plants grow in small pots, the gardener will have apparently the advantage of being able to take out the largest potatoes, by inverting the pots, without materially injuring the fibrous roots; but this practice will rarely be found eligible, because the plants, having the range of their roots confined to the limits of the pots, soon occupy the whole of their pasture, and therefore do not produce their tubers in succession, as they will under common circumstances. The lights should be drawn off during the day, when the spring is far enough advanced to permit this being done without injury to the plants; and early in May the pots may be taken out of the hot-bed, which may be employed for other purposes; and as it must necessarily have been kept very dry during the latter period of the growth

of the potatoes, it will generally afford a strong heat when well watered. I confine my plants (which are naturally of a very dwarfish growth) to small pots, because, under this mode of culture, the tubers acquire maturity sooner, and are better; but the crop is not so heavy, as where the roots are permitted to extend more widely; and therefore, where a larger but rather later crop is required, the best plan is to put the tubers to vegetate in small pots, and from these to remove them, with their roots and germes uninjured, to the hot-bed. I tried the effect of placing a few tubers (half a dozen only) on the floor of my cellar, disposing them just in contact with each other, and as soon as the germes were about four inches long, a hot-bed was made to receive them. This experiment succeeded perfectly, and as it is not attended with so much expense and trouble as either of the preceding methods, it will be found in many cases the most eligible. All that appears necessary to obtain an early crop, is to advance the growth of the plant as much as convenient under a low temperature, so as to avoid all unnecessary expenditure of its excitability, and, consequently, to preserve its germes and roots as much as possible uninjured by transplantation."

The only real difference between Mr. Knight's method, and that which we have practised for upwards of twenty years, as described above, is that he commences vegetation in a low temperature, and ours is commenced in rather a higher degree of heat; his reason is to prevent expending the excitability of the plant. Our success has, however, been so complete, that we question much if this excitability be injurious to the potato, by our keeping them always in nearly the same temperature.

Several writers in the same Transactions adopt methods similar to the following, for procuring young potatoes. That of Mr. Ashworth is given in the following words: "In the beginning of April, a number of large potatoes are selected, and laid up in a dry airy room; they are turned over four or five times during the summer, and all shoots which they make are taken off as they appear. These are used for the seed, and are planted in succession from the beginning of September to the end of December in boxes, in the following manner: In the bottom of each box, a layer of light vegetable mould, four

inches deep, is placed, on which the potatoes are laid about two inches apart, and these are covered with another layer of the same mould, and of the same depth. On the surface of this second layer, potatoes are again laid, and then covered as before; this is repeated until the box be full. The boxes may be kept in any of the fire-houses, or in a warm back shed, and in three months from the time of planting, young potatoes fit for use will be formed. It is to be observed, that the young potatoes thus obtained are much inferior in quality to those produced by vegetating plants; but as it is scarcely possible to bring forward potatoes in beds so soon, this plan is useful, when considered as a means of obtaining a luxury at so early a season."

This simple method will afford young potatoes, certainly, at a season when they cannot be had by any other means, and may be adopted by those, who have not the convenience of hot-beds or hot-houses. The boxes placed in any ordinary cellar will produce them; and if placed in a stable, or any other building where the temperature is mild, they will be produced in considerable quantities. They have been cultivated in boxes, planted in the usual way, and placed in hot-houses, but are not found to answer so well as on beds of hot dung.

Substitutes for forced potatoes have also been had recourse to, and we know of none better than a small potato, about the size of a pigeon's egg, which is often imported into this country from Holland, by some of the Dutch residents in this country. The merits of this potato are, that the skin is very delicate, and the size that of a middling-sized forced potato, and is much superior to forced potatoes, which are usually used before they are ripe, and are therefore waxy and of an unpleasant taste; whereas this potato, being fully ripened, is mealy, and of a delightful flavor, in fact excelled by few of our finest potatoes, when grown in their greatest perfection. It is planted in the spring in the open garden, and treated exactly as other potatoes are, and when ripe in autumn is of the size above described. It is kept in heaps covered with straw, and afterwards with mould, as is usually done by our general crops of that root; and sometimes left in the ground

where it grew, and covered with litter to exclude the frost: in this case it is dug up fresh as wanted for the table. During winter and spring it is sent to table, and when washed the outer skin readily separates from a finer and close glossy inner skin, which must be carefully preserved in undergoing the necessary culinary operations of dressing. They should never be peeled, nor scraped with a knife, but only this outer skin removed by the finger and thumb while washing, or with an half-worn soft brush. Few can discover the deception, and often, when young potatoes from the hot-beds, and those described have been placed upon the table, the difference was not recognized until tasted, and the preference has been uniformly given to the Dutch sort.

It is particularly necessary to state, that this potato should be grown in a soil of a light sandy nature, resembling the natural soil of Holland as near as possible. In stiff strong clayey soils it does not succeed, neither in the quantity of crop nor quality of the roots. It is also a difficult matter to procure this potato genuine from Holland, the Dutch being not over particular in executing their orders with nicety, so far as regards sending the genuine article wanted. The cultivators of bulbs are not unacquainted with this fact. The most certain way is to employ some person resident there to purchase them on the spot, and export them to this country. Indeed, when a correspondent is residing in Holland, it is much the best way to have a few bushels imported annually for use. The seed tubers should be imported, if not annually, at least every second year, as they naturally degenerate when cultivated here for more than two years. The quality of the potato is so extremely delicate, that it soon becomes unfit for this important purpose, when grown in a cold, wet, or strong soil.

The late Dr. Noehden, in a communication to the Horticultural Society, gives the following method of preserving potatoes for winter use, as a substitute for young ones. Not that it is to be preferred to the use of the Dutch potato described above, but is deserving of being made known, as it may lead to some experiments upon this important subject. "By young potatoes," he says, "are generally understood those tubers which have not attained their full age and growth. In this

stage, the substance is generally finer grained, and more cohesive, than when they are farther advanced; they are what is called waxy, and differ in taste from those that are full grown. If they could be preserved in this state through the winter, for the use of the table, it would doubtless be an acquisition, and something of this kind I have seen attempted. When the general crop of potatoes was gathered, at the usual period of their harvest in autumn, the small tubers, which are frequently disregarded and left to their fate, were picked out and collected. They were deposited in a box, between layers of sand, and thus kept till December. At this time, the box being opened, they were found in perfect preservation, and fit to be dressed for the table. To give them all the appearance of young potatoes in a side dish, the tender skin on them was to be preserved, for peeling them would have destroyed that effect. It was recommended for that purpose, when they were to be used, to soak them previously for a certain number of hours, in water, and then to toss or shake them in a piece of rough flannel or baize, between two persons, backwards and forwards, or rub them between the hands; by which operation, the coarse outer covering is loosened, and the skin remains clean and delicate, so as to exhibit all the exterior of young growing potatoes. On trying them upon the table, I found that some had, really, the fine waxy taste of young potatoes; but that others, and perhaps the greater part, though resembling the former in size and looks, had entirely the grain and flavor of the old potatoes. That difference is, undoubtedly, to be ascribed to the different states of maturity, at which the one and the other had arrived. The mealy ones, although equally diminutive with the others, had, in fact, reached their full age, and possessed, accordingly, the qualities which that age would give. Those of a waxy texture were unquestionably much younger, and had not come to maturity when they were taken from the ground. They were in that condition, which, by the taste, determines the name of young potatoes. If this be so, (and every probability seems to attend the reasoning,) it may be concluded that it is feasible to preserve young potatoes in the manner described, if they be gathered young; but to distinguish those which are so in the common harvest, in au-

tumn, from those which only appear so, would be difficult. The idea, therefore, presents itself of planting potatoes expressly for that use, which must be done at a later period than this vegetable is generally planted, let us say two months later, in June instead of April.

“When the general crop is matured and gathered in October, those will be still in their young state, their grain will be still fine, and their texture close; and if thus taken up, and preserved, according to the method suggested, it can hardly be presumed that, when brought to the table in winter, they will be greatly different in quality from that when they were gathered. They will in every respect be young potatoes, probably not much inferior, if at all, to those raised on a hot-bed; for it does not appear that this mode of keeping them has any effect in promoting their maturity, at least not to any perceptible degree. The sand employed should be of as barren a nature as can be procured, and, if possible, contain little or nothing of the vegetable stimulus. When the tubers are taken out of the ground previously to their maturity, they will not readily sprout, or emit roots, which circumstance is a security for the success of the method in question.”

Undoubtedly, by this late planting, waxy potatoes will be produced, because they are not fully ripe; but planting in June will not produce a crop of potatoes, at all similar in size or consistency, to be mistaken for young ones in winter. The laws of nature in this respect are curious: it is wonderful to see the exertions made by her to hurry forward, to overtake such of the children of her care, as may, either by accident or design, be detained behind their compeers. It is a well known fact, that many plants, natives of Alpine regions, spring up quite perfect in their structure, produce flowers and seeds, and mature the same in the short space of as many days, as the same species of plant, cultivated in our gardens, do in as many weeks. The practice, in some parts of England, is not to plant the general crops of potatoes till June, still they are far from being small, or like young forced potatoes.

Where potatoes are planted in frames or pits, sow thinly a little short-topped radish. They will come in for use before the potatoes will be injured by them, and will be making the

most of the bed. The seed should be sown in, as soon as the potatoes are planted; and if steeped for a few hours, previously to sowing, in milk-warm water, it will hasten the germination.

FORCING PEAS.

Few horticulturists have attempted to force this vegetable to any extent, or to produce it at any season much earlier, than that in which it ripens in the open borders, under the happiest circumstances; the rambling habit of this plant being probably the chief objection, as requiring more room than is generally found convenient to spare in our forcing compartments. They are, however, sometimes grown in the border of a peach-house, to a limited extent, and found to produce their fruit tolerably well; they are also found to succeed, by being sown in October, in pots or boxes, and transplanted into others at the time they are to be placed in that compartment. They may be cultivated in pits, planted in pots, and kept in a progressive temperature, according to their stages of growth, beginning at 40° , and rising gradually to 60° , at which temperature their blossom will set, and afterwards gradually risen to 65° or 70° , at which point they will ripen their fruit.

It is expected that the introduction to our gardens of Mr. D. Bishop's excellent dwarf early pea will give quite a new feature to the forcing of this vegetable, its diminutive habit and great earliness being extremely well calculated for growing in pits, or in pots in hot-houses. One important part in the cultivation of peas, even in the open borders, is their transplantation; and in any endeavour to accelerate them by artificial means in any forcing structure, it must be particularly attended to, as the most likely means of making them more prolific, as well as to prevent their running too much to straw. Air is important for their growth in any structure, and will prevent them likewise from being drawn too much to straw, as well as preventing the mildew, which, in a close moist atmosphere, would be extremely injurious to them. When the plants have attained a size, and are producing blossom, their

top shoots may be shortened, which will lessen their tendency to grow to straw, and bring forth additional sustenance towards the formation of pods.

FORCING BEANS.

Beans may also be forwarded by the same means as peas, although not generally practised; they will succeed better than any of the sorts of pea hitherto tried for that purpose. The early small Mazagan, the dwarf cluster, or fan, are the best kinds. The former should be topped, as is done in its general culture. The latter, from its humble growth, will not take up much room; both should be transplanted as directed for peas.

FORCING RADESHES.

In order to have radishes as early as possible, recourse must be had to the assistance of hot-bed frames, by which means they may be had in perfection from December till they can be procured from the natural ground. During winter, hot-beds of moderate dimensions should be put up of dung or leaves, about two feet high, just sufficient to promote the germination of the seeds, and to forward the plants moderately, without drawing them up slender, &c. When the bed is put up, cover it with about six or seven inches of light garden-mould, upon which sow the seeds, not too thick, but regularly over the bed. For a three-light frame, sow one light with the true short-topped early-frame radish, and the other two with red and white turnip-radishes for variety, keeping each sort separate. If the bed be formed of leaves alone, or of dung, which may not be wanted when this crop is off, a little lettuce-seed may be sown along with the radishes, which, if the former be carefully gathered for use, the lettuces will have a good chance to succeed them, and come in seasonably in spring. When the crop of radishes is gathered, the frame and lights will probably be wanted for other purposes. When they are removed, hoop the bed over with stout rods, and cover with mats at night, and in bad weather, until the young lettuce get strong. The seeds of the radish, from its nature, require to be buried much

deeper than that of the lettuce, therefore, in sowing, sow the radishes first, and slightly beat them down with the back of a spade, so as to dispose of the seed in as equal a manner as possible, as far as regards the depth. Cover them about an inch with some fine mould, either sprinkled over them with the spade, or sifted over them through a coarse rudder; then sow the lettuce-seed thinly, and cover it carefully about a quarter of an inch. Radishes succeed very well by sowing at this time a thin crop of salmon, or long-rooted radish, in one light; and the other two with turnip-rooted radish, as above, for the principal crop, and sowing regularly all over the bed a thin crop of the short-topped sort, which will come in before the others, and will be gathered for use before it injures the crop of the other sorts. In this case, no other sort of seed, such as lettuce, should be sown. When the plants appear, give them a large share of air, either by tilting up the lights in cold wet weather, or removing them for a few hours every fine day. After they have been up a few days, thin them regularly out, to admit of their having plenty of room to grow to their proper size, as well as to prevent them drawing too much, and spoiling each other. At this thinning, they should be left at about an inch square; when the heat begins to decline, let it be renewed, as occasion requires, with linings of hot dung or leaves; let water be given in such a quantity as the state of the bed and weather may require, observing to let the chill be taken off it first, by adding a sufficient proportion of hot water, or standing the water in pots in some of the hot-houses now at work. To keep up a regular succession of radishes at this season, if one bed be put up about the beginning of the month, let another be also got up by the end, or first week in February. At this season, young radish leaves are often used as an ingredient in salads, mixed with mustard, cress, &c.; where this is required, a bed should be put up every fortnight, and the young tops will be supplied from the thinnings of the plants, leaving still a sufficient crop to come to maturity on the beds.

The frames will require to be matted up at night, or otherwise covered, so as to guard against all accidents from frost, or the like.

FORCING MUSTARD AND CRESS.

Mustard and cress, unless when grown upon an extensive scale for the market, are seldom grown at this early season in hot-beds, as in most families, the consumption is so small that it would not repay the trouble and expense, unless grown in small frames of one light or two, together with rape and other salads, that are used in a very young state. Most gardeners find a supply more conveniently procured, where there are hot-houses, by sowing them in flat pans, boxes, or pots, and placing them over the flues, or on the footpaths of their forcing-houses.

These seeds soon vegetate in almost any temperature, and will arrive at perfection in any light soil. Rotten tan and vegetable mould are most generally used for this purpose, upon which the seeds are sown rather thickly, and sometimes covered with half an inch of the same sort of mould, or left uncovered; by the latter plan, they are less liable to be gritty, or have earthy particles mixed with them, which are not easily washed out. For this purpose, boxes about four or five inches deep, one foot broad, and of any convenient length are used, and answer many other purposes extremely well, such as propagating plants by cuttings, rearing tender annuals from seed, &c. These boxes are filled with any light mould, and placed over the flues, or in any convenient part of any of the forcing-houses. The seeds are sown in them, and watered; in a few days the salad is fit for use; one box of the above size sown with mustard, and another with cress, will produce enough for any ordinary family for three days. There should be a number of such boxes, two of them sown every third or fourth day during this month. If placed over the flues, in a stove or other house of high temperature, they will require plenty of water every day; but in houses of lower temperature, less water should be given, as they are apt to damp when too thickly sown, and kept over watered.

Where the consumption is great, or where there is not the convenience of hot-houses, these salads may be produced in hot-beds put up purposely of dung or leaves; a slight heat will produce them, but not so rapidly as when in a greater. Beds of two

feet high, covered with rotten tan or vegetable mould, or even fine sharp sand, to the depth of four or five inches, upon which sow the seeds thinly in rows across the bed, keeping each sort separately. As soon as the plants vegetate, give them plenty of air, and give water as occasion may require; but much less will be required in hot-beds than in hot-houses, for fear of the crop damping off. Along with them, may also be sown a little chervil (where wanted), rape, or any other salad-plants of like habits. Cover slightly at night with mats, or other covering when the weather is severe, but admit as much light as possible, by removing the covering early in the morning. In gathering the crop for use it should not be pulled, but cut neatly off with a sharp knife, holding the tops of the plants in one hand, and cutting them off about half their height with the other. They should be carefully washed, and placed in a clean salad-basket, but not allowed to remain in the water longer than necessary to clear them of any particles of mould that may be attached to them; neither should they be gathered long before using, as they will lose much of their flavor by the first, and soon lose their tenderness by the second mode. They should also be kept separate, and an equal portion of each sent from the arden.

FORCING CARROTS.

Carrots may be brought to early perfection by being sown on a hot-bed of dung, or leaves, any time this month. A mild temperature is only required, and a bed of two or two and a half feet will be found sufficient for this purpose. When formed to that height put on the frame, and when the heat is up, earth it over with some very light dry sandy loam, or vegetable mould, to the depth of seven or eight inches. If the seeds, previous to sowing, be well rubbed between the hands, with a mixture of sand or dry mould, it will cause them to separate more readily, as, from their singular construction, they are apt to stick closely attached, and therefore, without this precaution, would be difficult to sow regularly upon the bed. After being thus rubbed, they should be mixed with a portion of light dry mould, say three times their own bulk,

and in this state put into a large pot or box, and rendered rather damp by water, and then placed in a melon or cucumber-frame, or in any of the hot-houses at work. In a few days the seeds will have germinated, and when they are in this state, take them to the bed, which is supposed now to be ready for their reception; sow them carefully, and cover lightly with fine dry light mould, to the depth of a quarter of an inch. This promotion of the germination of the seeds will forward the crop considerably, and when the heat begins to decline, apply gentle linings. When the seeds are up, admit plenty of air, as already directed for mustard and cress, when the weather becomes mild enough not to injure them. By the end of February, or beginning of March, the frame and lights may be removed, and the beds covered at night, and in bad weather with canvas or mats, supported by means of hoops placed over the beds. The Early Horn and Altringham sorts are to be preferred for this purpose.

FORCING MINT, TANSEY, AND OTHER HERBS.

Mint, both for salads and mint sauce, will be wanted in most families. Tansey is not now so generally used as formerly, but still some families hold Tansey pudding in high repute, particularly in the north of England. For the purpose of having these plants in perfection in winter, and early in the spring, it is necessary to plant some of their roots upon a slight hot-bed of dung or leaves, protected by frames and lights. A bed of the same size as has been recommended for carrots, will be found perfectly sufficient for this purpose, upon which place six or eight inches of dry light mould of any sort, on which to place the roots pretty thickly together, so as to take up as little room as possible. When the roots are all placed in the frame, cover them with mould of the same description. Give water as occasion requires, and admit at all times plenty of air; by the middle or end of next month, the frames and lights may be removed, if wanted for other uses, and the plants protected by hooping the beds over, and covering with mats or canvas. When Tarragon is in request in a green state, it may be procured in the same manner; a three-light

frame will produce enough of all of these herbs for any ordinary family. When the crop is all gathered, or no longer wanted, the roots of the mint and tansy should be gathered up and thrown away, as by mixing with the mould or dung they would become troublesome weeds if dug into the ground; and as they are so easily procured, their loss will be of no consequence.

Mint may also be potted in large pots, and placed in any of the hot-houses at work, and four or six large pots will provide a supply for an ordinary family.

FORCING RHUBARB.

Rhubarb is found to be much improved in flavor by being blanched, as well as effecting a saving of sugar, in rendering it agreeable to the palate when dressed. In blanching rhubarb, the plant is more or less accelerated in its growth, and therefore may come under the denomination of being a forced vegetable. However, before the idea of blanching it occurred, or at least before it was put in practice, it had been forced in a variety of ways for many years. The agreeable acidity of the foot-stalks of the leaves, which are the parts used, together with their nearly approaching in flavor to gooseberries while in an unripe state, renders rhubarb an article of garden produce in much demand, at seasons when the other cannot be got, unless in a preserved state. Probably the medicinal properties of rhubarb may be beneficial to many constitutions, and may be admitted into the very small catalogue of pleasant medicines; but, without deciding that question, there are few tables at which rhubarb does not appear, in shape of tarts, during its season, which, in the open ground, is of short duration, in consequence of the extreme rapidity of its growth. To obviate this, and similar cases, has long been the anxious endeavour of the gardener; in few has he succeeded so completely as with the plant before us, and with so little trouble. According to the doctrine of Knight, rhubarb, like most other perennial herbaceous plants, contains within itself, during winter, all the organizable matter, which it expands in the formation of its flower-stalks and leaves, and requires neither food

nor light to enable it to produce either of them; all it requires are heat and moisture. If the roots of such plants be removed entire, as soon as their leaves become lifeless, they will be found to vegetate, after being placed in situations sufficiently warm and moist, as strongly and vigorously as if they had remained in their first position; but they will of course only continue to live to produce one crop of leaves, unless their leaves be allowed to perfect themselves under natural circumstances, to collect sufficient nutriment for the future demands of the plant; therefore we find rhubarb (as is also the case with asparagus and sea-kale) to produce those parts of their leaves, stalks, &c., which are used in culinary preparations in perfection, without their endeavouring to push out fresh roots to collect nourishment from the mould in which they are placed.

The roots of rhubarb dug up entire, at any period after the decay of the leaves of the preceding season, and carried into any forcing-house, there placed upon the surface of the borders in any convenient place, and supplied with plenty of water, will produce a reasonable quantity of leaf-stalks for use during the whole winter months; and by this simple means, we can obtain this desirable esculent from the end of November till it comes in again in the open ground.

In removing these roots, it must be done with as large balls of earth as convenient, not that they require the earth to nourish them, but it is the means of equalizing the degree of temperature and moisture round their roots, and prevents them from being dried up by the action of the air. They may readily be blanched in any situation, by covering them with mats, supported by hoops or large pots, such as are used for sea-kale, only larger, or in default of these, boxes may be placed over them, so as to exclude the light; or they may be equally cultivated by placing the roots upon the surface of a pit or common frame, formed of hot dung or leaves, and covered with wooden sashes, or the glasses put on, and kept closely covered with mats or soft hay, straw, or any other light material. The roots placed in a cellar, or any other spare house, when the temperature can be kept a little above that of the open air, will be found to produce a good crop, and come in before that in the open ground. Rhubarb may also be successfully forced

at any season after November, in the ground, where it is grown for a general crop, by placing deep boxes over the roots, and covering them with hot dung or leaves, as is usually practised for sea-kale. By this means, it can be had all winter, where there is not the convenience of a hot-house or vinery, in which to place it, but of course it will be attended with a little more trouble. The boxes for this purpose should be made of half-inch boards, and jointed close, so as to exclude the rank steam of the dung from getting in to the young shoots.

Knight has practised forcing this vegetable with success, by digging up the roots of young plants early in winter, and placing them in large and deep pots, each pot being made to receive as many as it would contain. Some fine sandy loam was then washed in to fill entirely the interstices between the roots, the tops of which were so placed as to be level with, and about an inch below the top of the pot. These pots were covered with others of the same size inverted upon them. They were then placed in a situation in the vinery, where nothing else would prosper being so much shaded; there, they were copiously supplied with water, the plants vegetated strongly, and from each pot he was enabled to obtain three successive crops; the leaf-stalks of the two first crops being crowded so closely as nearly to touch each other over the whole surface of the pots. As soon as the third crop of leaves was broken off, and a change of roots became necessary, those were removed from the pots, and a fresh supply put in. The roots that produced the said crop were planted out in the open ground, their tops being covered about an inch with mould, and he conjectures, that they will, after a year's rest, be fit to be brought into forcing at a future period. Should they, however, perish, he adds, it will be of very little consequence, as year-old roots raised from cuttings of the roots, or even from seeds sown in autumn, will be found sufficiently strong for use. We are, however, of opinion, that plants from four years' old and upwards are much better for general crops; but, for Mr. Knight's plan, the younger ones are certainly to be preferred.

FORCING DANDELION.

This plant, being indigenous to our road-sides, and waste sides of fields, &c., has seldom been cultivated, even although it is found in considerable quantities on the stalls in Covent Garden Market. It is not however difficult, nor yet unworthy of culture as a salad-herb, but is also worthy of being forced at mid-winter, when other salads are scarce, and it is then held in much esteem; it has a pleasant bitterness of taste, and is considered a good stomachic.

We have forced this plant for some years; for which purpose prepare a slight hot-bed, of such dimensions as have been recommended for carrots, or mustard and cress, upon which place six or seven inches of mould of any sort, provided it be dry, into which to plant the roots, which generally will not be difficult to procure. The roots should not be planted deep; about one-third of their length should be above the mould; as the heat gets up, and before the plants begin to spring, cover the whole over with saw-dust, quite dry, up to the level of the tops of the plants, observing to water the roots previously to laying on the saw-dust, that it may be kept as long dry as possible. As the plants shoot up, which they will begin to do in a few days after planting, let them be regularly covered with more saw-dust, the drier the better; continue this method until they have attained the height of four or five inches. When they are fit for use, they should be carefully cut, taking a thin slice off the top of the crown of the root to keep the leaves better together; in this way, after being carefully washed, they are sent to table, where they are eaten, either by themselves or mixed with other salads. Where saw-dust is not to be conveniently procured, rotten tan sifted and kept dry for the purpose will answer equally well. The leaves of this salad are not only used, but the roots also, which, when washed clean, are sent to table, sometimes attached to the leaves, and often separated from them. To those fond of a variety of salads, this will present a valuable addition. The French eat the roots and leaves between thin slices of bread and butter.

FORCING SEA-KALE.

Few vegetables are improved more by cultivation than the sea-kale, and few are more improved by forcing. In its cultivated state, it is found to be in April and May, far superior to what it is in its natural habitats; but, when forced at mid-winter, it is superior to any other vegetable with which we are yet acquainted. Possessing such merits, it is not surprising that many methods have been tried to bring it to perfection, and to protract the season of it to the utmost possible extent.

The most general way of forcing sea-kale is, by planting it upon the beds or rows in which it grows in the natural ground; for which purpose, (the leaves and stems of the plants being trimmed,) the surface of the beds or rows is forked up carefully, so as not to injure the roots; the whole is then covered with finely sifted coal-ashes, over each plant is then placed a large flower-pot inverted, with the holes stopped to prevent the admission of steam, or regular blanching-pots are placed over them in the same manner; previous to this, there should be a quantity of dung or leaves put up to ferment, and which, after being turned over once or twice, are fit for use. These pots are to be covered with this dung or leaves to the thickness of a foot or eighteen inches, according to the state of the weather and quality of the dung. While the operation of covering the pots is going on, beat the dung regularly down, as it is laid up, to make the whole as compact as can be; when finished, it should have a ridge-like appearance, for the better throwing off the rain or melting snow. Great care must be taken not to make this ridge too large, so as to produce a superabundance of heat; this must be carefully guarded against, for it is better that the temperature be too low, than too high, during the whole process. In the first case, no harm can ensue to the crop, only that it will not come into use so soon; but the latter may be attended with much danger to the plants, and will always produce them weak and ill-flavored. The pots should be so placed, that a portion of the coal-ashes may be gathered round the base of them, to prevent the entrance of steam, which would destroy the crop if admitted in any quantity. The heat during the whole process of forcing should



ERICA MACULATA



ERICA CICUTARIA

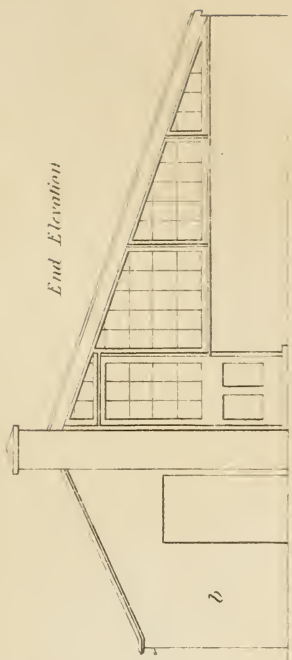
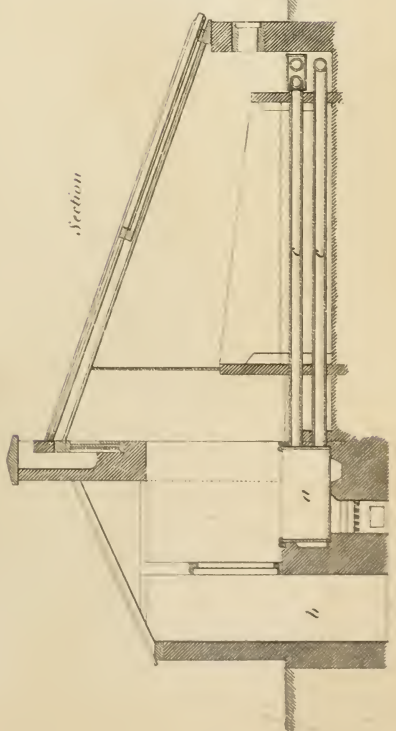
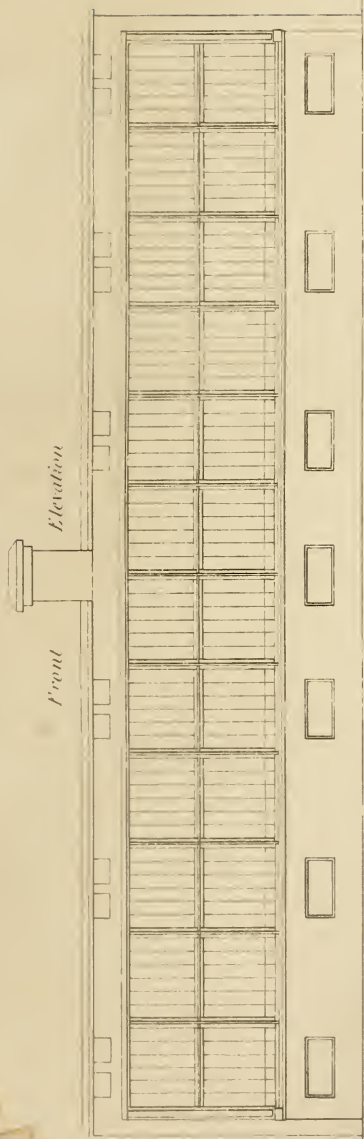


ERICA TETRALIX



ERICA VERTICILLATA

P. M. Kelly



London Published by Thomas Kelly, Underwood, New, Marsh, & Co. 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

be kept up above 50° , and not allowed to exceed 60° , and in about three weeks after covering up, the crop will be fit for use. When the ridge of dung is finished, thrust in two or three watch-sticks, by which the temperature can be at any time ascertained. It is seldom necessary to add to the ridge of dung, unless the weather should be extremely cold and windy; and the same dung used to force one set of roots, with the addition of a small quantity of fresh added, will be in a fit state to place over a second set of roots, and so on, during the forcing season, rejecting such as become too much decayed. As the crop is gathered, and no appearance of more shoots springing, the plants are then to be allowed to rest till spring; but to protect them from the injury of frost, leave a few inches of the rotten parts of the dung over them. In spring they will shoot up and perfect leaves, so as to fit themselves for forcing again in the same manner the following season. One set of roots will last in good condition for forcing, in this way, for many years; however, as they will become eventually large, and spread their crowns to a breadth, not to be conveniently covered with the blanching-pots, new plantations should be made every third or fourth year; this will allow of a succession of fresh roots for forcing, and as the oldest are destroyed, will thus afford a piece of ground fit for any crop to follow.

Sea-kale is also forced on hot-beds, exactly as is already described for asparagus, and is blanched by keeping the lights covered with mats or straw; or in want of lights, wooden shutters are made so as to fill the spaces of the lights; by this method the roots are, of course, of no use after the crop is gathered. In placing the roots into a frame for this purpose, it is necessary to cut away all the superfluous large roots, and leave only such as have buds at their extremity. If each piece having a bud be separated from the rest of the root, and be eight or twelve inches in length, it will be found, under good management, to produce as good a crop as if the whole mass of roots were retained. By thus reducing the roots, a greater number will be got into one frame, and each of these parts of the root will be found to contain sufficient organizable matter to perfect the crop. After the same manner, the roots may be

placed in any forcing-house now at work, either in large pots planted in light mould and sufficiently watered, and blanched by inverting another pot of like dimensions over them; or they may be planted in the borders, and blanched by covering with the proper blanching-pots. In either case, as they require little air and no light, any situation in the house, such as behind the flues, or in any other place where no other plant can live, will be found a suitable place for them. We would recommend the following method for forcing this esteemed vegetable, as being decidedly the neatest of any method that we have seen practised. The experience of several years, during which we adopted that method, convinces us of its superiority. The expense, in the first instance, is more than that of any of the methods in general practice, but the neatness of the beds, both while they are forcing, and while they are resting, will be sufficient to compensate for the expense, where neatness is combined with utility. In forming the beds, which should be rather above the general level of the surface, particularly if the soil be strong and wet, proceed by building parallel walls of open brick-work (or what is generally understood by dove-cot work, such as is used in the building of cucumber and melon-pits) of any length the beds are to be made, and at two feet distant from each other, not including the thickness of the walls, which for durability should be nine inches thick, that is, the thickness of the length of one brick, or they may be only four inches thick, which will answer the purpose equally well, but will not last so long. These walls should be three feet high, say two feet under the surface, and one foot above it. The mould, previously to the walls being built, should be excavated to the depth of two feet. When the walls are built, every second space should be filled up with rich light mould, having a good proportion of sand in it, about nine inches above the level of the tops of the walls, to allow for settling, in which to plant the plants, which should be chosen out of some one-year-old plants, being strong and well-rooted; and which should be carefully planted in March or April. They should be well supplied with water during the first season, and the surface of the beds kept covered a few inches with rotten dung, both to enrich the plants, as well as to prevent

the drought from checking their growth during summer. If well attended to in this respect, they will be in pretty good state for slight forcing the first season after planting, and will be completely so the second, and will continue so for several years. The tops of the walls should be secured by having a wooden plate, by way of coping, both to resist the wet and render the bricks less liable to be displaced. The spaces left empty are intended to be filled with dung, or leaves, or any other fermentable matter, the heat from which will penetrate through the open brick-work in the walls sufficiently to warm the roots in the beds; but as that heat would not, in the middle of winter, be powerful enough to accelerate vegetation sufficiently fast, a provision is made which will prevent the escape of the heat of the linings, and at the same time blanch the crop and keep the whole dry, by having covers constructed of wood, which should rest upon every fourth wall, so as to include two beds of plants, and one lining only, which lining should be made of well-fermented dung or leaves, so as to produce as little steam as possible; but, in order to guard more effectually against any accident of that kind, the lining so enclosed should be covered with rotten tan, or dry light mould, sufficiently to keep down the steam, if too powerful; and in the top of the wooden cover should be two, three, or more small ventilators, according to the length of the beds, four inches square, which can be opened and shut at pleasure, both for the escape of any superfluous steam, as well as for the examination of the progress of the crop and state of the beds. Steam, if not too powerful, will not injure the crop, and we have never had one instance of any accident arising from that cause. Every alternate lining will be on the outside of the wooden frame or roof, and can be turned over, watered, or more fresh dung or leaves added, according to circumstances, and may be made up to any height required. When the crop is fit to gather, remove one of the boards on the side of the frame, which for this purpose is left moveable, being hinged to the other parts of the frame; when one bed is cut, proceed in the same manner to the opposite side, and remove the moveable board there. We have sometimes covered the beds nine inches or a foot over with rotten tan, and some-

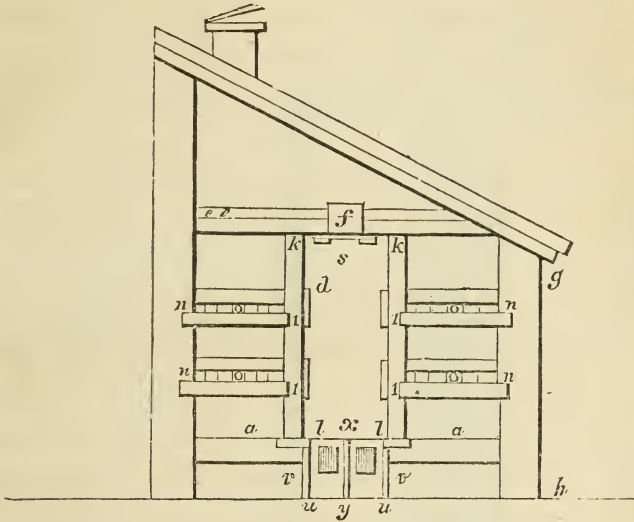
times with saw-dust; in such cases, the enclosed lining was left uncovered, as the steam proceeding from it could not injure the crop; by this method we gained more heat, but the state of the crop was not so readily ascertained as by the other method. Rhubarb, when required to be blanched, may be managed exactly in the same way; but where there is the convenience of forcing-houses at work at this season, it is not worth the expense and trouble. The covers should not be so high as to form too large a space under them to be heated; if eighteen inches in their highest part, it will be amply sufficient.

FORCING MUSHROOMS.

Where mushrooms are required all the year, they cannot be had without some degree of artificial heat, and therefore may come under the head of forced vegetables. The most successful and convenient method of producing this vegetable during winter is decidedly that introduced by Mr. Isaac Oldacre late gardener to Lady Banks. It is the common method of cultivating mushrooms in Germany, and by him introduced into Russia, during the time he was one of the gardeners to the late Emperor. It was subsequently adopted by him at Spring Grove, and now, with slight variations, almost universally practised throughout the British gardens. The house in which the mushrooms are grown may either be a detached building, or may be erected behind a pine-stove, or other hot-house, and of dimensions according to the quantity of mushrooms required.

The mushroom-house of Oldacre, of which the accompanying figures are representations, is described by him in a communication to the London Hort. Soc. as follows: "The outside walls (*g h*) should be eight and a half feet high for four heights of beds, and six feet and a half for three heights, and ten feet wide withinside the walls. This is the most convenient width, as it admits of a set of shelves three feet and a half wide on each side, and affords a space through the middle of the house three feet wide for a double flue, and to walk upon it. The wall should be nine inches thick, and the length of the house as it may be judged necessary. When the out-

side of the house is built, make a floor or ceiling over it as high as the top of the outside walls of boards, one inch thick, and plaster it on the upper side (*ee*) with road sand, well



wrought together, one inch thick, (this will be found superior to lime), leaving square trunks (*f*) in the ceiling, nine inches in diameter, up the middle of the house, at six feet distant from each other, with slides (*s*) under them to admit and let off air when necessary. This being done, erect two single brick-walls (*vv*), each five bricks high, at the distance of five feet and a half from the outside walls, to hold up the sides of the floor-beds (*aa*), and form one side of the air-flues (*uu*), leaving three feet up the middle (*lxl*) of the house for the flues. Upon these walls (*vv*) lay planks, four and a half inches wide, and three inches thick, in which to mortise the standards (*k*) which support the shelves. These standards should be three and a half inches square, and placed four feet six inches asunder, and fastened at the top (*kk*) through the ceiling. When the standards are set up, fix the cross-bearers (*1n, 1n*) that are to support the shelves (*oo*), mortising one end of each into the standards, the other into the walls (*u*). The first set of bearers should be two feet from the floor, and each succeeding set two feet from that below it.



Having thus fixed the uprights (*kk*) and bearers (*ln*) at such a height as the building will admit, proceed to form the shelves (*o, o*) with boards an inch and half thick, observing to place a board eight inches broad, and one inch thick, in front of each shelf, to support the front of the beds. Fasten this board to the front of the standards, that the width of the beds may not be diminished. The shelves being finished, the next thing to be done is the construction of the flue (*p*) in the ground plan, which should commence at the end (*l*) of the house next to the door, run parallel to the shelves the whole length of the house, and return to the fire-place, where the chimney should be built. The sides of the flue inside to be the height of four bricks laid flatways, and six inches wide, which will make the width of the flues fifteen inches from outside to outside, and leave a cavity on each side betwixt the flue and the walls that are under the shelves, and one (*xy*) up the middle,

betwixt the flues, two inches wide, to admit the heat into the house from the sides of the flues. The middle cavity ($x y$) should be covered with tiles, leaving a space of one inch betwixt each tile for the admission of the heat. The top of the flues, including the covering, should not be higher than the top of the brick walls that form the front of the floor-beds. The reason why the sides of the flues are recommended to be built stronger than usual is, because they support the walk. The walk itself is formed by three rows of tiles, the outside rows making the covering of the flues, and those of the centre one covering the middle cavity (x, y) as above-mentioned. The outside cavities of the flue are left open, the tiles which are placed over the flues being laid so as not to cover these cavities, which allow the heat of the sides of the flues to ascend."

The house being constructed, the beds are to be made in the following manner:—

At any season of the year "collect a quantity of fresh horse-dung, that has not been exposed to wet or fermentation, clear it of long straw, so as to leave one-fourth in quantity of the shortest litter, when incorporated with the horse-droppings; then add a fourth part of tolerably dry turf-mould, or rather maiden earth, and mix it well with the dung before mentioned; the advantage derived from mould, or maiden earth, is the union of the whole into one compact solid substance, so congenial to the growth of mushrooms. If dung, from the rides of a livery stable, or the round of a horse-mill can be procured, and mixed with a fourth part of short litter, and added to as many horse-droppings as will cause a gentle warmth when made into beds, it will be found superior for the production of mushrooms to horse-dung that is gathered from the stables." This being procured in some quantity, proceed to make up the beds in the following manner: "Form the beds on the shelves and ground-floor, by placing a layer, about three inches thick, of the prepared mixture, then with a flat mallet beat it as closely together as possible; next add another layer of the compost, repeating the same process as before, and so until the beds be formed into a solid body seven inches thick, making the surface of the beds as smooth and as

even as possible. The reducing the beds into a very solid body is a most essential point, for without it, you cannot expect success, and the thickness of them must also be particularly attended to, for where there is a much greater body, the beds will be subjected to a strong fermentation, and will be prevented by evaporation, from retaining that consistency in the dung which is absolutely necessary for the production of a good and plentiful crop. On the contrary, if a much less quantity be laid together, the heat and fermentation will be insufficient to prepare the beds for the nourishment of the spawn; but the assistance of both, to the extent prescribed, cements the materials, which, in addition to beating, increases greatly their solidity. The proper vegetation of the spawn, and the consequent crop of mushrooms, depend entirely upon a moderate genial heat and fermentation, neither too strong nor too slight. As soon as the heat in the beds is a little more than that of milk from the cow, (say from eighty to ninety degrees of Fahrenheit,) beat the beds a second time, to render them, if possible, more solid; then make holes with a dibble three inches in diameter, and nine inches asunder, through the compost in every part of the beds. These holes will be the means of cooling the beds, and preventing that excess of heat from taking place, which would produce rottenness and render them unproductive. If the beds do not attain the heat required in four or five days after putting up, (which may be known by plunging a thermometer into one of the holes), add another layer of the compost two inches thick, which will probably increase the heat sufficiently; if not, a part of the bed should be taken away, and the remainder mixed with fresh horse-droppings, and wrought together in the same manner as before, in order to produce the proper degree of heat. Beds made after this manner readily generate natural spawn in summer, and frequently in the winter months."

SPAWNING THE BEDS.

"In three or four days after the holes have been made, by observing the thermometer it will be found that the desired degree of heat has been obtained, and the inside of the holes

will also have become dry: the beds are then in a good state for spawning, which should be done while the heat is on the decline. If this operation be deferred until the heat be quite exhausted, the crop will be late and less plentiful. Fill every hole with spawn, which should be well beaten into them, and then make the surface of the beds solid and level. It is of no consequence whether the spawn put into the holes be in one lump, or in several pieces, it is only necessary that the holes should be well filled. About a fortnight after the spawn has been introduced, examine the holes, and if the spawn has suffered any damage from over-heat or too much moisture in the beds, introduce fresh spawn in the same way as before. On the contrary, if the spawn be found good and vegetating freely into the compost, such beds (if required for immediate production) may be covered with mould, agreeably to the rules hereafter laid down, and the beds intended for succession should remain unearthed, in the summer, three weeks or a month, before you wish them to produce; and in winter a month or five weeks. If the spawn be introduced in hot weather, air must be admitted, as freely as possible, into the shed, until the spawn has spread itself through the beds; for if the place be kept too close, the beds will become soft and spongy, and then the crop will neither be abundant nor of good quality. Such beds as are intended to be put into work must be covered with a coat of rich maiden earth, in which its turf is well reduced. Then spread it regularly over the surface of each bed, two inches thick, and beat it as solid and level as possible. The earth used should neither be too wet nor too dry, but so as to become compact, and exhibit when beaten a smooth face. If too moist, it will chill the beds and injure the spawn. On the contrary, if too dry, it will remain loose, and in a state by no means favorable to the growth of the mushrooms; but when solid, it produces not only finer mushrooms but in greater quantities, as the earth from soils of lighter texture invariably grows them weaker, and of inferior quality, and such beds cease bearing much earlier. From the time of covering with earth, the room or shed should be kept at 50° or 55°, and the light must be excluded. If the heat

be suffered to exceed to any considerable degree, it will cause the beds to ferment a second time, and weaken, if not totally destroy the spawn; but should a much lower degree of temperature than the one prescribed be permitted to prevail, the mushrooms will advance slowly in their growth, and if watered in that state, numbers of the small ones will be prevented from attaining perfection. In watering them, extreme caution is necessary, as well in the mode of application as in the temperature of the water, which should be nearly as warm as new milk, and very lightly sprinkled with a syringe, or a small watering-pot, otherwise the mushrooms are sure to sustain damage. If cold water be used, and given plentifully at one time, it will not only destroy the existing crop, but the spawn also, and render the beds so treated of no farther utility. If the beds have been suffered to become very dry, it is better to give them several light waterings, than one heavy supply. In gathering the mushrooms, great care must be taken not to disturb the small ones, which invariably, with good management, surround the stems of those that are more early matured. The best method is to twist them up very gently, in all instances, where you can, but where you are obliged to cut them, great care should be taken to divest the beds of the stems of those which are cut, as they would rot, to the great injury of those that surround them. If the preceding directions be properly attended to in the management of the beds, they will continue to bear for several months, and a constant supply may be kept up by earthing up one bed or more every two or three months, according to the quantity of mushrooms required at one season. When the beds are in full bearing, if the mushrooms become long in their stems and weak, it is certain that the temperature is too high, consequently air must be admitted in proportion to the heat. As the old beds decline in bearing, and produce but few mushrooms, take the earth clean off the dung, and if you find the litter decayed, destroy the beds and replace them by new ones, being careful to select any good spawn that may present itself; but if, on taking away the earth, you find the beds dry, solid, and full of good spawn, add a layer of fresh compost, as before recommended,

three or four inches thick, mixing it a little with the old, and beat it as before. By adhering to this mode of renovating the old beds, a continual supply may be kept up."

It must be acknowledged that mushrooms produced in this way are far inferior in flavor and juiciness to such as are produced upon beds in the ordinary way, and which is fully described in the Culinary Garden; still the above method possesses one decided advantage over the other methods of cultivating this precarious vegetable, which is, that they are produced with much less trouble and expense in winter, and with much more certainty. Mushrooms are invariably found to be finer flavored, more juicy, and heavier, when cultivated upon beds of considerable depth. Hence it would appear that they require nourishment, to a considerable extent, and that nourishment seems to be derived from the quantity of proper materials with which the beds are composed. Where there is a greater body of matter contained in the beds constructed as above, the mushrooms are found to increase in size, therefore it becomes obvious that, instead of the beds being only seven or eight inches deep, if they be from a foot to fifteen inches, the crop would be benefited thereby. In making them up to this thickness, great care ought to be taken to prevent any unnecessary fermentation. The droppings should be partially dried before using, and the heat allowed to exhaust itself nearly in one course of compost, before another is laid upon it. As the proper degree of temperature and solidity is of the utmost importance, beds made of the above thickness will retain their temperature longer, and will be less subject to the changes of moisture to which the German beds are liable, owing to their want of sufficient thickness. We have, however, thought it advisable to make the above long extract from the Hort. Trans. as being the ground plan of the most regular method of cultivating mushrooms yet published. The success of the plan, under the management of the intelligent individual who introduced it, we have frequently witnessed, as well as practised ourselves; but have always found that an increase of body in the beds was attended with the most success, and less attention required after the fermentation had subsided.

Mushrooms may also be readily obtained throughout winter, in any moderately warm apartment, by filling boxes, or hampers, or any other thing that will keep the compost together. The compost, the same as for the beds already described, should be well beaten into them, and spawned when the rank heat is upon the decline; any number of boxes or hampers may be filled with it, and kept in reserve until wanted in any dry shed or loft, where there is no chance of wet or frost penetrating. When it is thought necessary to put them to work, take any number of them and mould them over as above directed, and place them in any temperature, not exceeding 60°; by occasionally giving a slight watering, so as to keep the materials in an equable degree of moisture, plenty of mushrooms will be produced. Boxes thus filled may be placed in any of the forcing-houses, where the temperature is not too high; and, as the crops become scanty and weak, remove them again to the loft or shed, from which they were at first taken; and then, after resting for a few weeks, may be brought into the house again, and if not too much exhausted by the first crop, will produce a second, and sometimes a third crop, during the winter months. Having a sufficient number of boxes, a regular supply may be thus kept up, with little trouble or expense.

FEBRUARY.

SUCCESSION AND NURSING PINE-PLANTS.

The general management of both these divisions of the pinery are, at this period of the year so similar, that it may be sufficient for us to say, that the temperature of both should be kept up to the same as directed last month, and that air and water should now be more liberally given. No opportunity of good weather should be lost sight of at this season, when air can be given, which will strengthen the plants, and prevent them drawing up weak, and assuming a sickly yellow color, which they are apt to do when long shut up in a close atmosphere.

Healthy plants will now be beginning to make roots, and therefore should be supplied with water once every six or eight days, or rather as often as they appear to be dry. We have already more than once alluded to the mistaken practice of watering at stated periods; no such plan should ever be pursued, as some plants require water often, and others more seldom, even in the same pit, this depending generally upon the healthy or unhealthy state of the plants.

FRUITING PINE-PLANTS.

It may be found necessary, about the beginning or towards the middle of the month, to turn over the bark or leaf-bed, the heat having probably declined considerably; and it may also be necessary to add a portion of fresh tan, or leaves, to set the whole in a state of fermentation again. In adding fresh bark or leaves, it should be always observed to trench the bed up from the bottom; and in mixing the materials, care must be taken to keep the fresh matter next the bottom, or at least not near the top; a sufficient quantity of the old half-decayed matter should be brought up to the surface, in which to plunge the pots. The plants should be examined

when taken out of the bed, to see if any of them require shifting. This should not be done as a matter of course, but as a matter of necessity. Those which appear stunted for room in the pots should be carefully taken out and repotted into larger pots, without disturbing the ball but as little as possible. If the ball seem hard, and the mould appears exhausted, loosen the surface of the ball carefully, by gently patting it all round with the hand, but if too hard to be thus easily broken, it has the more need of being shifted; in such cases, as much of the outer sides of the ball should be displaced, so as not to shake it quite to the centre, and the roots carefully separated, and such as are injured in the operation, or decayed, should be thinned out with a knife. A larger pot should be prepared by being previously well drained, and the plant thus treated potted in it, carefully spreading out the roots, and shaking the mould in among them, but not using a stick, as is often practised, by which the roots may be injured. The plant thus repotted should be placed rather deeper in the pot than it was in the former, and if any useless or decayed leaves remained about the bottom of the stem, they should be displaced, thus affording an opportunity for fresh roots emitting themselves near the surface of the mould. After potting, a moderate supply of water should be given, to settle the mould about the roots. Those plants which appear healthy, and are judged to be in pots sufficiently large, should not be disturbed, as it is presumed that they have been all potted in autumn in full-sized pots, in which they are to perfect their fruit. Nothing can be gained by repotting plants at this stage of their growth, most of them starting into fruit, and many of them already farther advanced. The act of shaking them out of their pots at this time must certainly give them a check that they will not get over for some weeks, and will be evidently detrimental to the formation of the fruit, which will be now in an embryo state. Those plants which appear sickly, and do not stand steady in the pots, may require to be taken out, and the whole of the ball carefully broken; the roots should then be examined, and such as are decayed should be displaced, and the plant repotted into the same sized pot; or, if very sickly, into a smaller pot than that in which it was first placed, which, when the plant

is recovered and fully established, will be potted into a larger pot at a future examination. All the plants which seem in good health, and are in sufficiently large pots, should not be disturbed, only a little of the surface-mould gently loosened and taken off, and fresh surfaced with mould. Those plants which may have already started into fruit, and appear to be in want of room for their roots, should be carefully turned out of their pots and placed in larger, taking every possible care not to break their balls nor disturb their roots. When all the plants are carefully examined, and the bed again ready for their reception, which operation should be going on while the plants are examining, so as to keep them out of the bed as short a time as possible, they should again be replunged up to the brims of the pots, unless it be apprehended that the heat will be too powerful in the bed; if that be apprehended, plunge them only three-fourths of their depth at first, and after the heat declines, either plunge them to their full depth, or add a top-dressing of half-decayed tan or leaves from some of the other departments where it can be spared, or have some prepared for the purpose. It is, however, much better to plunge them to their full depth at first, as moving them so often about is detrimental to them, and the less they are now disturbed until their fruit be swelled off, the better. In plunging them, care must be taken to place the pots quite level, so that they will hold their share of water, and the plants stand perpendicularly to each other. To facilitate this, a trench should be formed out in the bed the whole of its length, the pots placed in it at regular distances from each other, and the tan, or leaves, firmly packed in all round. The distance at which they should stand from each other must be determined on by the size of the plants; they should not be closer, at all events, than twenty or two-and-twenty inches from the centre of one plant to that of the next.

In arranging the plants in the bed, the largest should occupy the backward row, that is, the row farthest from the front of the house, and the tallest plant should stand in the centre of this row; the next in order of height upon the right hand, and left alternately, and so of the other rows until the whole be plunged, the smallest plants occupying the front row,

or that next the front of the house. It sometimes, however, happens, that a few plants may be much farther advanced than others, and may be upon the eve of attaining maturity; such may be placed at the ends of the rows, at that end of the bed next to where the flues enter the house, and will thus be forwarded into maturity, it being supposed to be the warmest part of the house, and, by placing them there, it will not cause a break in the arrangement of the stock, when they are removed after being ripe; their place can be filled with such plants, from the succession-house, as will fill up the space. Should it so happen, that their being so placed will forward their fruit sooner than may be desired, they may, in that case, be placed at the other end of the bed, which is supposed to be the coldest part of the house, and by that means be retarded; or they may be at once placed in the succession-house, where the temperature is much less than in the fruiting-house. It would, however, be inconvenient to place them, perhaps, in the centre of the bed, where, from their height, they probably ought to stand; for, when cut and removed, the space which they occupied could not be filled without endangering those around them.

When they are all placed in the bed, they should have a little water at their roots, and a gentle syringing all over-head, to wash off any filth or dust that may have fallen upon them during the regulation of the bed. This syringing should now, as the season advances, be more frequently and more copiously administered to them. The temperature now, until the heat of the bed rise sufficiently, should be kept up by fire-heat to 64° or 68° ; this, however, will be in a few days again sufficiently increased. The thermometer then should be allowed to rise to 70° or 74° , and continue increasing from that to 75° or 78° , keeping the temperature as near to that point as possible.

Air must now be freely admitted every day that the state of the weather will admit, so as to prevent the thermometer exceeding 83° or 84° . When the weather is so inclement as not to allow of a sufficient share of fresh air being given, let the fires be kept up during the day, so that the air may be admitted without lowering the temperature of the house below

75° or 78°. Whether the houses be ventilated by proper ventilators in the walls, or by the opening of part of the lights, it will, in frosty days, be advisable to hang a thin mat opposite the aperture, to temperate the current of air. When the house is closed for the night, let plenty of water be spilt upon the floors and flues to produce a plentiful steam; this should be attended to regularly every night; and, in fine clear weather, a little fire should be made in the morning early, to heat the flues just sufficient to produce a like effect. If the bed should get rather warm, but not so as to render necessary a removal of the plants, give plenty of water to the roots; if this be attended to, there is little to be apprehended from their being injured by a rather brisk heat at this season. The heat of the bed can always be ascertained by keeping watch-sticks thrust into it at or near the ends, and towards the middle, which an experienced person will ascertain by pulling out the sticks, and feeling the heat of them by the hand; but the most accurate mode, of course, is to plunge the bulb of a thermometer into the bed to the depth of the bottom of the pots, the heat then will be thereby ascertained to a sufficient nicety, which should now be not less than 80° at the bottom of the pots, or if it be 90° no harm will ensue.

FORCING PEACHES.

The peach-house being put in order, as directed last month, the trees pruned and tied, the flues cleaned, and the borders forked up and watered with liquid manure, the lights should now be finally shut up, and only opened to admit air as necessity may require. This should be admitted in large portions while the buds are swelling, and until the blossom begins to expand, no harm can come over them by a free admission of this necessary agent, provided that the temperature be not allowed to fall too low; and if frost be excluded, the slower that the sap is put into motion, the stronger will the buds break, and the blossom will, consequently, be stronger: the wood-buds will also push with greater regularity and strength. The temperature should not be allowed to exceed 45° for the first part of the month, but be kept as near that point as possible by the admission of air. Towards the middle of the

month it should be gradually raised to 50° , and by the end of the month to 52° . The regular keeping of this temperature is of the utmost importance to the welfare of the trees, as well as to ensure a crop of fruit. The times of regulation being at six or seven o'clock in the morning, and eight or nine at night. Until the blossom begins to expand, the trees should be syringed every morning about nine, and every evening about four or five, when the house is shut up for the night. Water should be poured upon the flues at the time that they are sufficiently warm, for the purpose of producing a steam, but this will not be often the case, unless near the entrance of the flue from the furnace for some time; however, as soon as the flues are sufficiently heated to keep up the required temperature, this steaming should be attended to every morning and evening. The borders should be kept moderately moist by watering, particularly round the flues and where they enter the house, being more apt to become dry there than at a greater distance from the heat. Great caution must be paid that the temperature of the house be not allowed to exceed the points above, for if heated to a high temperature, and then allowed to fall to a lower, the buds would not only push weakly, but would absolutely fall off. Although we have advised syringing both mornings and evenings, it is not to be done in a careless nor immoderate manner, but should be done with the finest rose upon the syringe, to act as a dew upon the branches and buds, to soften them, and to render their breaking more regular. The syringe best suited for this purpose is that of *Reid's Patent Syringe*, which can be purchased of any nurseryman or respectable ironmonger. If the garden-engine be used, or any of the coarser syringes commonly in use, too much water will be spilt upon the borders of the house, which should not be deluged with wet, but only kept moderately damp. If the borders be kept too wet, much danger will be incurred of the buds falling off before they expand, and consequently a failure must ensue.

Peaches have been forced by means of dung-heat in this country, extensively at Dagenham Park, and are also forced by dung in Denmark and Holland, but we do not think that the practice merits general adoption.

FORCING VINES.

The vinery being put in readiness for forcing, as directed last month, the fires by the first of this month may be begun to be regularly made, but so moderate that the temperature may not exceed 50° or 52° for the first week, and afterwards 55° , until every bud in the house has begun to swell. This is matter of vast importance in the forcing of all fruits, and particularly that of the vine; for if the temperature were begun and kept up to a high point, the consequence would be, that only a few of the leading and strongest buds would start; the greater part, particularly such as are situated next the bottom of the shoots, would not spring at all, and consequently the crop would be proportionably scanty. It is, therefore, a leading feature of good management, that every bud on the vines break; not that all will probably be ultimately allowed to remain, but it is much easier to take off a shoot, or a fruit, than put one on. From the time the house is first shut up, the syringe should be freely used upon the branches, for the same purpose as hinted at in the peach-house; namely, to soften the shoots and buds, and enable the latter to push more freely. The stems and larger branches, which were directed last month to be enveloped with moss or haybands, should be kept well and regularly moistened, by pouring water in a sufficient quantity upon them, for if they be kept continually moist, the rise of the sap will be facilitated, and the strength and breaking of the buds greatly promoted. After all the buds have evidently begun to push, or shown signs of vegetation, which will be observed by the loosening of that brownish cotton-like envelope, with which they have hitherto been protected, and the rudiments of the young shoot bursting through it, the temperature should be raised to 60° , 65° , and 70° . This rise of temperature must not, however, be sudden, or the same evils which have been hitherto guarded against would follow, that is, the shoots would push weakly, and many of them would not show fruit. If the rise of temperature be effected in the course of the month progressively, it will be good management. The borders within the house should be supplied with water, occasionally giving good water-

ings with liquid manure. The syringe must continue to be used mornings and evenings freely during the whole month, and the house regularly filled with steam every morning by eight o'clock, and in the evenings soon after the fires are lighted, and when the flues will be sufficiently warm. When the fires are made up for the night, a few pot-fuls of water may be sprinkled over the flues, this will keep up a moist steam during the night. There need be no fear of overdoing this operation, for vines are found to break or push their buds best and most regularly in a humid atmosphere: indeed, some good gardeners introduce a quantity of unfermented horse-dung, or leaves, into the vinery, which they build up in a ridge, and by continual turning, watering, and adding to it, keep up a steam in their houses. This steam is of the utmost importance where the vines are infected with insects, as the steam thus produced contains a large portion of ammoniacal gas, which is well known to be destructive to all insects, while it does not injure the vines, at least before their leaves expand. This practice is highly conducive to the health of the plants; but where neatness and order are a consideration, it may be objected to, as having no very agreeable appearance, and a much less pleasant smell; a substitute, however, has been pointed out by an eminent horticulturist and chemist, and may be with fewer objections applied. This substitute is formed by pouring a solution of *crude muriate of ammonia* upon quick lime, and the gas thus obtained may be applied with a pair of bellows to the plants. The great use of steam in forcing the vine seems to be, (no matter whether the steam be that of pure water, or of that combined with any of the other gases,) first to soften the wood and eyes, and enable them to break more freely; and secondly, the destruction or prevention of insects. These powerful and useful effects being produced by such simple means, are not to be neglected.

Air should be admitted freely, to strengthen the young buds as they are developed, and also to keep the temperature at an equal height. Changing the air thus daily is of the utmost use; the confined air, particularly when charged with the rank vapour from the dung, where it is used, or that of the confined air in the house where that is not even used, will soon stagnate

or get foul, and should be allowed to escape, and the house re-charged with fresh air.

It sometimes happens that vines, which have not been pruned until a short time before they are begun to be forced, as well as those, whose shoots may not have been fully ripened in autumn, will bleed after vegetation has begun, which, if not prevented, will materially weaken the vines, and injure the forthcoming crop. This bleeding is not easily prevented; but, as in all cases, a preventive is better than a cure, it will, if it once happen to a gardener to any serious extent, sufficiently remind him of the necessity of pruning his vines in autumn, soon after vegetation ceases, but not till the wood be ripe. Were this always attended to, this complaint would seldom require a cure.

Many remedies for bleeding have been used. Abercrombie recommends searing the place over, and covering it with melted wax; or with warm pitch spread upon a piece of bladder; or to peel off the outside bark to some distance from the place, and then press into the pores of the wood a composition of pounded chalk and tar, mixed to the consistency of putty.

Speechly recommends to peel off, or divest that part of the branch adjoining the wound of all the outside bark, then with a sponge to dry up the moisture, and immediately to wrap round the wounded part a piece of an ox's bladder, spread over with tar, or pitch made warm, in the manner of a plaster; then tie the whole securely with a strong thread, well rubbed with bees'-wax: these must remain on for three weeks or a month.

Nicol recommends searing the wound with a hot poker, or red-hot iron, in order to dry it, and then to apply hot wax.

Knight, in a communication to the Hort. Soc., recommends four parts of scraped cheese to be added to one part of calcined oyster-shells, or other pure calcareous earth, and this composition pressed strongly into the pores of the wood.

When the vine is in full leaf, it is not liable to bleed when cut, therefore the largest branches may be cut during the growing season with safety.

Vines are also cultivated in almost every pine-stove; however, the introduction of low pits for cultivating the latter, from the want of sufficient room, precludes the vines from

those structures; but where there are fruiting and succession-houses sufficiently capacious, we can see no objection to their being introduced, as by that means, ripe grapes can be had much earlier than is generally deemed necessary to have the principal crops in the vineries. Vines intended to be grown in the pine-stove should always be planted outside the house, and their stem introduced into the pine-house, when required to be put into a state of vegetation. They are often, however, left in the house, and never taken out during the period that they are not in a vegetating state. We would advise, consistently with our own practice for many years, the taking of them out when the fruit is cut, and of course the wood ripened, and to train them along the front of the house to temporary stakes driven into the border to support them, or to fix them to the front of the house in such a way as not to create a shade, nor to be in the way of the front sashes or ventilators.

They may be taken into the house any time from November till January, and trained *only* up the rafters, so as not to shade the pines during winter. Their shade during summer, if not allowed to ramble too much, will rather be an advantage to the pines than otherwise; and we would plant vines where metallic houses are used, purposely to give a partial shade, with their leaves, to the pines. The general management as to pruning, thinning, and training, will be nearly similar to that to be described in the regular vinery, so that any separate directions on that head may be deemed unnecessary.

M'Phail, and many gardeners since his time, contend that they should remain always in the pine-stove, without being removed while they are not in a state of vegetation, and he gives the following directions for their management: "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 to bear the fruit, the other to be cut down short, and to grow long shoots to bear 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, at least the fruit will be higher flavored."

After the vines are pruned, tie them nearly up to the glass with matting, to iron rods or laths fixed to the rafters on purpose. As soon as they begin to swell in their buds, and show 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 injured by frosts. If the buds burst strong and bushy, it is a good sign that they will show fruit; but if weak, the contrary will be the effect; and if they miss showing fruit on the fourth or fifth joint, they will show none at all, and in that case, the young shoot that does not show fruit should be broken off, as it would only take the nourishment from the others, which have shown fruit. Do not let more than one or two bunches grow on one bud, for if too many be left on the plant they will not swell well. If the vines be planted inside of the house, care must be taken to keep them sufficiently watered; and in dry weather, in the spring and summer, the border on the outside of the house, in which the roots of the vines run, should be plentifully supplied with water.

The forcing of vines by dung-heat has been often tried, and has, in many cases, succeeded to the utmost expectation. In Holland they are very generally forced by that means in pits constructed for the purpose, and one spirited horticulturist has adopted the practice, under the direction of a Dutch gardener in this country. In Denmark, wooden houses are so constructed, that by means of linings of hot dung applied to them, grapes are brought to tolerable perfection.

In the years 1825 and 1826 we practised a somewhat similar plan, and perfectly succeeded. Having a few vines of the Royal Muscadine, which annually bore immense crops of fine grapes upon a wall, but which seldom or ever ripened, the situation being adverse; we erected a temporary house the length of the wall, and at four feet distant from the wall put in a row of oaken posts, which were charred as far as they were covered with the mould. These posts stood two feet above the ground-level, and were braced together at top with a piece of plank two inches thick, and four broad, upon which the bottom of the sashes rested, as well as the rafters, which latter were four inches by two, and rested in the usual way

upon the above wall-plate, and top of the wall, to both of which they were fixed by a bolt, which was so constructed that they could be removed at pleasure. The upright row of posts, above noticed, was nine feet apart, and the space between the ground and the top of them was left open. In front of this house we sunk a pit, for the linings of hot dung or leaves (the latter generally used), four feet deep and two in width; this cavity was supported on one side by a nine-inch brick-wall, and covered with wooden shutters to keep in the heat, and so to force both heat and steam through the spaces between the posts which supported the roof. When the dung was past its first strong heat, we drew part of it into the inside, and formed a ridge sufficient to keep up the desired temperature, and by adding fresh leaves or dung could keep up a heat sufficient to ripen grapes by the month of July. The internal space to be heated was so small, that we found it no difficult matter to keep up a higher temperature than was even required. The back wall of the house, if it may be so called, (but which really was one of the garden-walls, against which the house was erected,) was only nine feet high, which only afforded sufficient head-room to get in to dress the vines, which were planted, as already observed, upon the back wall, and as the heated dung forming the ridge occupied a considerable proportion of the lower angle of the house, a small space consequently was left to be heated. By these means we enjoyed all the benefits of a humid mild heat, so favorable to the vine, as well as producing those gases which are disengaged from the dung while undergoing fermentation, and which, though destructive to animal life, are more than probable not uncongenial to that of vegetables. In principle, this differs very little from the Dutch and Danish practice, but in the convenience and arrangement we consider it superior, as the dung or leaves are brought into this house, without opening any part of the structure, which, particularly in winter, is attended with inconvenience and loss of heat, and there is no waste of the materials used in producing the required heat, by their being exposed to the changes of the atmosphere. The sashes were all moveable, so that whatever portion of air was required could be admitted, either from the outside or from

the inside. The whole of the structure, excepting the wall of bricks and the row of posts, was moveable, so that when not required for one piece of wall, it could be carried to another. In this house, during the winter months, we constantly grew small salads, mustard, cress, &c., in shallow boxes and flat pans placed upon the ridge of dung. It also served for a hospital for sickly and diseased exotics, which, when placed upon the dung or plunged into it, soon recovered, if their diseases did not proceed from causes, to which this mode of treatment was not congenial. The roof was regularly matted up at nights, when the weather was so severe as to require it.

In a communication to the London Hort. Soc. by Mr. Anderson, a method of forcing vines upon a large scale is recorded, as practised by J. French, Esq., at Hornden, Essex, for nearly the last twenty years.

“About the beginning of March, Mr. French commences his forcing by introducing a quantity of new long dung, taken from under the cow-cribs in his straw-yard, being principally, if not entirely, cow-dung, which is laid upon the floor of his house, extending nearly from end to end, and in width about six or seven feet, leaving only a pathway between it and the back walls of the house. The dung being all new at the beginning, a profuse steam rises from the first heat, which, in this stage of the process, is found to be beneficial in destroying the ova of insects, as well as transfusing a wholesome moisture over the yet leafless branches, but which might prove injurious, if permitted to rise in so great a quantity, when the leaves are pushed forth. In a few days, the violence of the steam abates as the buds open, and in the course of a fortnight the heat begins to diminish; it then becomes necessary to carry in a small addition of fresh dung, laying it in the bottom, and covering it over with the old dung freshly worked up; by which a renovated heat and a moderate exhalation of moist vapour are produced. In this manner the heat is kept up throughout the season; the fresh supplies of dung being always laid at the bottom, in order to smother the steam, or rather to moderate the quantity of exhalation; for it must always be remembered, that Mr. French attaches great virtue to the supply of a reasonable portion of the vapour. The

quantity of fresh dung to be introduced at each turning, must be regulated by the greater or smaller degree of heat that is found in the house, as the season and other circumstances appear to require it. The temperature kept up is pretty regular, being from 65° to 70° . Mr. French contends, that the moist vapour transfused through the house is essentially beneficial, not only because it discourages the existence of insects, and destroys their ova, but it likewise facilitates the setting and swelling of the fruit."

Forcing vines by means of dung-heat, has been occasionally practised since the days of Justice, in Scotland, and Lawrence and Switzer, in England, but not much attended to till of late years. That it is practicable, is placed beyond all doubt; but the question is, whether it be more economical than the more usual mode of applying fire-heat. Mr. Knight gives the following directions for ripening grapes in an inclined melon or cucumber frame, either with dung-heat or without:—After "placing the bed at three feet distance from the wall to which the vines were trained, and introducing their branches into the frame, through holes made at the north end of it (the vines having been trained to a southern wall), as soon as the first violent heat of the bed has subsided. The White Chas-selas grape thus treated, ripens in July, if the branches of the vine be introduced in the end of April, and a most abundant crop be thus obtained; but the necessity of pruning very closely, renders the branches, which have been forced, unproductive the succeeding season, and others from the walls must be consequently substituted. I have," he says, "always put a small quantity of mould in the bed, and covered it with tiles. If an inclined plane of earth be substituted for the hot-bed, and vines be trained in a frame adapted to it, the grapes ripen perfectly in August; and if small holes be made through the sides of the frame, through which the young shoots of the vine can extend themselves in the open air, a single plant, and a frame of moderate size, will be found annually to produce a considerable weight of grapes. For this purpose, the frames should not be more than eight or ten feet long, nor more than five or six in breadth, or the young shoots will not be so advantageously conducted out of them into the open air; and

the depth of the frame, either for the hot-bed or for the inclined plane of earth, should not be less than eighteen inches. The holes in the sides of the frame, through which the young shoots are to pass, should of course be closed during the spring, and till wanted; and if the weather be cold, it will be necessary to cover the frames during night. When the grapes are nearly full grown, and begin to ripen, it will also be highly advantageous to draw off the glasses during the day in fine weather, by which means the fruit will be exposed to the full influence of the sun without the intervention of the glass, and will attain a degree of perfection, that it rarely acquires in the vinery or hot-house."

Grapes are obtained in bad seasons by covering the established plants upon the wall with a temporary frame of rafters, upon which are placed any spare lights, that by that time may have been removed from the early peach-houses, or other houses where the crops may have been gathered; sometimes a temporary flue is built, to give an additional warmth, and to counteract the effects of damp, as well as to ensure the ripening of the fruit, and their preservation afterwards for almost any length of time. In other cases, the glasses alone are found sufficient for the purpose of ripening the crop.

A market-gardener near Bath, some years ago ripened grapes under hand-lights. In this case, the fruit remained within the glasses, and enjoyed the protection of the glass, while the shoots were allowed to extend themselves in the open air, by being let out of the glass on removing one of the panes near its top.

A succession of ripe grapes (as described by several writers in the Hort. Trans.) is to be obtained by growing the plants in pots, in very rich mould, and watered with liquid manure. The plants to be placed in any of the forcing-houses of suitable temperature, and when ripe, removing the fruit upon the plants into a dry airy apartment, of a regular temperature. They are said to keep in this way longer in a perfect state than any other. Vines grown in pots have a curious appearance when loaded with fruit, and are not only useful for prolonging the season of this excellent fruit, but are highly

ornamental, either in the houses where they are grown, or introduced among exotic plants in the green-house or conservatory. Although the vine in general is allowed a greater latitude for its roots to run into than any other of our cultivated fruits, it is nevertheless found to produce tolerable bunches in pots, containing not more than two cubic feet of mould. Pots of that size, filled with rich mould, are asserted by Knight to be capable of nourishing a vine, which, after being pruned, covers twenty square feet of surface, if they be liberally supplied with liquid manure.

The retarding the maturation of grapes till a late season is as important an object to the gardener as to facilitate their ripening early in spring, and appears to be less understood; for where there is extent sufficient for the adoption of both plans, grapes may be had fit for the table every day in the year. The sorts of vines most fit for a late crop, are not, as is generally the case in the culinary garden productions, fit also for the earliest: the case is otherwise. The Sweet-waters and Muscadines, and some others, are fittest for early crops, requiring much less time to bring them to perfection; whereas, the Muscats, Syrian, White Nice, Black Damascus, St. Peter's, and some others, are the fittest for late crops, requiring much longer time in coming to their full size, and also a considerable time after attaining that size, before they ripen, and more particularly their properties of remaining a long time upon the vines after they are ripe before they show symptoms of decay; and, last of all, their retaining a saccharine sweetness after they are considerably shrivelled up. These, therefore, should be made choice of for the latest crops; and if retarded, by removing the lights entirely off the house, so as to keep back the swelling of the buds till as late a season as possible; and after it is no longer safe to trust the advancing buds to the weather, to put on the lights all night, taking them down during the day, so as to keep them as much exposed to the air as possible, and using only a little fire. While the vines are in bloom in autumn, when the fruit is approaching to its full size, give a little fire, to prevent any check to their swelling off, when the nights begin to get cold, during the rest of

autumn; and as long as the fruit remains upon the vines, give only such fire-heat as will prevent the effects of damp from destroying the fruit.

The latter sorts of grapes are thus preserved till long after Christmas. Arkwright, a writer in the Hort. Trans., has treated this subject more systematically, by gradually habituating his vines into a state of late bearing. He chooses for that purpose the later kinds of vines, and grows them in houses used alternately for pines and vines. About the middle of February, he removes his pine-plants into another house, and the preceding year's crop of grapes being gathered, he takes down the glasses so as to admit the free access of air at all times till the end of April, when the buds of the vines begin to swell. At this time, he applies a little fire-heat during the night in cold or cloudy weather, and air is freely admitted. At this time, he again brings in his pine-plants, where they remain till the following February. By this late and slow process, the grapes do not begin to ripen till towards the end of October; and some of the very late kinds not till Christmas. When he has occasion to introduce a young vine into the houses where his late grapes are grown, it is found, by the second or third year, to have lost its disposition to break into leaf at the accustomed season, although treated exactly like the other plants in the house. So powerful are the effects of habit. His general treatment of the vines, in regard to pruning and training, does not differ from the common practice.

FORCING CHERRIES.

The temperature in this compartment should be regularly attended to, and not allowed to exceed 50° by fire-heat during the day; after the admission of plenty of air, it may be allowed, during the day, to reach 60° , but not higher. Air should be admitted regularly every day; and when the weather is unfavourable for its free admission for more than one or two days together, let the fires be kept slightly up, to allow the sashes either being opened, or the ventilators, if the house be aired by those means; for nothing is so injurious to cherries,

plums, and apricots, than being long kept in a close atmosphere. Water should also be regularly and moderately given them, but not in too large a quantity, as until the fruit be fully set, they should be cautiously supplied with that element. After that time, they will require it in a more liberal quantity. The house should be regularly steamed, mornings and evenings, by sprinkling water upon the flues, which will, in a great measure, serve for watering at the roots; while the buds are swelling, and until the blossom be nearly expanded, the syringe should be used once a day, both for the softening of the buds and the suppression of insects.

Cherries are subject to insects both in the forcing-houses and on the open walls; care, therefore, must be taken that they do not get a-head at this time; for if they do, the injury will be considerable. The green fly will be apt to visit them as soon as the young shoots and leaves come out, and recourse must be had to fumigations with tobacco for its destruction, as well as the syringe, applied with all its force upon them, at such times as the blossom is not endangered by it. There is a small caterpillar, which is often very annoying in the cherry-house, and this must be looked for carefully; wherever any of the leaves appear curled up, it is almost sure to be found within them; these, for the greater security, should be picked off, and carried out of the house.

Such cherries as are intended to be accelerated upon the open walls, under the glass-case recommended last month, should, towards the end of this month, be covered up and regularly attended to, in respect to air, water, &c., in the same manner as already directed.

FORCING FIGS.

The preceding directions for cherries are also applicable to figs. The temperature should be steadily kept, during the first fortnight of the month, at or nearly 50° , and gradually, towards the end of the month, raised to 58° by fire-heat, allowing five or seven degrees of rise by sun-heat.

Water must be regularly supplied as the state of the plants may require, and air be freely admitted daily. A watchful eye

should be kept for the appearance of the red spider upon the leaves, which should be expelled by force of the syringe, or else by sprinkling sulphur mixed with water upon the flues, when pretty warm, as directed last month; however, if the plants be kept regularly watered, and the house ventilated, this enemy will not be seen; a too dry and very high temperature is the agent that brings it into life, and water applied with considerable force from the syringe, or the application of sulphur, as above described, are probably the only means of getting rid of it:

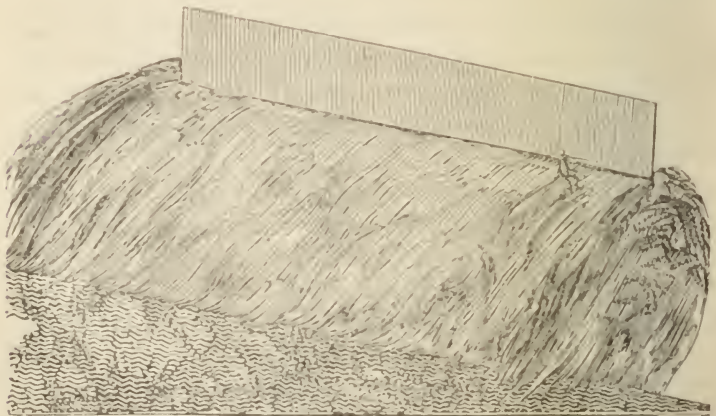
FORCING CUCUMBERS AND MELONS.

If the instructions given last month under this head have been acted upon, and no accident has occurred to the plants, they will, by the end of the first week or beginning of the second, be fit, most probably, for planting out into the beds, in which they are to perfect their fruit; however, if the plants be weak, which will chiefly be owing to either too little heat, or drawn up slender and long-stemmed, owing to an excess of heat and insufficiency of air, in either case they should not be finally transplanted out until they be quite strong and stocky.

If such in either case be their state, it is better to defer their final transplanting until they be perfectly strong enough, which, with good management, will be by the end of the month at farthest. If planted out before they acquire sufficient strength, their future progress will be slow, and their crop unproductive. It often happens, from unforeseen circumstances, that the seeds sown some days, or even a week after the first sowing, will be in a fit state for *ridging* out before those first sown; in such cases, plants of that age should be made choice of. Throughout the whole culture of these fruits, the plants most rapidly grown are always the best, and will produce the finest fruit, and also in the greatest quantity. Beds for their reception, after they are removed from the seed-bed, should be preparing for them without delay. By the beginning of the month, the dung of which they are formed should be got in readiness; that is, it should be duly pre-

pared, by repeated turning and fermenting, giving plenty of water, should it be dry in the first instance, or heat-dry in the process. The materials of which such beds should be built, ought to be of the very best quality, and if leaves are to be had, one-third or even one-half of them should be added. They most generally give out a more lasting and more regular heat than beds built of dung alone. If either material be scarce, a bed of the same dimensions may be built of fagots, heath, or any useless spray, which, being heated by means of linings of hot dung, or dung and leaves, will be found to answer the purpose very completely. Beds of this kind we have already recommended, and for many purposes they are better than beds built entirely of dung; in such beds there is little chance of the roots of the plants sustaining injury by burning or over-heat.

In either case, as the plants appear strong enough for *ridging* out, let the beds be prepared for them, of the following dimensions. For cucumbers, their height at the back should not be less at this season than four and a half feet, and three and a half in front, that is, if they be built upon ground nearly level. The following reasonable method has been recommended by Knight, and is now very generally adopted. Instead of building the beds upon a level piece of



ground, he places them upon an inclined plane of earth, elevated about 15° , making the bed afterwards of an equal height, both at the back and front, as in the annexed figure.

The merits of this improvement are obvious: the bed of fermenting matter is all of an equal thickness, and consequently will be more equally heated; the mould in which the plants are planted are also of an equal thickness, a matter of much importance to the plants; the angle of elevation given, the plane upon which the whole is built, is sufficient to present the glass at a proper angle to the horizon, so as to enjoy the greatest portion of the sun's rays at this season, when it is low in the horizon, which is a matter of much importance to the welfare of the plants; this angle may be more or less, according to the season of beginning the forcing. The frames which he purposes for such beds are also like the dung-bed, of the same depth both at back and front. Thus the plants are placed at an equal distance from the glass, which is not the case with plants in frames of the usual construction.

According to the instructions already given for building the seed or nursing-bed, this should also be placed upon a dry, and if possible, a sheltered spot, fully exposed to the morning sun, but sufficiently sheltered from the north, east, and west, and the ground should be rather elevated just the size of the intended bed, to afford greater means of applying linings, as well as to keep their bottoms free from water or damp. On no account should the beds be sunk under the surface at this season. According to the dimensions of the frame or frames, mark out the size of the bed, by driving in four stout stakes, one at each corner of the intended bed, and as nearly perpendicular as possible, which will be a guide in building the bed. In marking out the size of the bed, let it be a foot at least larger on each side than the size of the frame. The whole being marked out, proceed to make the bed, by shaking and mixing the dung or dung and leaves well together, as it is laid on, and beat it well down with the back of the fork as the process goes on; avoid treading it, as beds too much trodden seldom work so pleasantly, and are more liable to burn than such as are suffered to settle gradually of themselves. In this manner proceed, until the bed has arrived at nearly the desired height, taking care to build the sides and ends as nearly perpendicular as possible. When within six inches of the desired height, level the whole surface, and

upon it place six or eight inches of short dung, such as has fallen upon the ground round the bed in the process of making it; level the whole, and, as soon as finished, place the frame and lights upon it, which should be kept closely shut down until the heat rise briskly. If it be slow in rising, cover the lights with mats for a day or two. As soon as the heat rises, open the sashes a little, to let the rank steam pass freely off.

The beds being thus finished, and the heat sufficiently up, it is then in a fit state for earthing over, forming the hills for the reception of the plants, &c. Before laying on the mould, take off the frame and lights, and level the surface equally over, if much sunk into irregularities in the process of heating. The whole being regulated, and the frame and lights being replaced, proceed to cover the whole surface of the bed with rich dry light mould, which, for this purpose it is presumed, has been prepared during the summer, and a portion of it placed under cover, so as to be dry and ready for use when wanted. The thickness that this mould should be put on, need not be more than two or three inches, just merely sufficient to prevent too much rank steam at any time filling the frame. Under the centre of each light, place on a little hill about one bushel of the same mould, upon which the plants are to be planted as soon as the heat is sufficiently up, so as to warm the mould in the hills to a sufficient temperature. The higher these hills are kept the better, so as to admit of sufficient space for the plants, in order that they may not touch the glass.

The reason for planting the plants upon these hills, instead of not earthing the bed all over at once, is merely by way of precaution in case of violent after-heats; in which case, it will more readily pass off in steam between the hills, as well as offering the advantage of using the beds a few days sooner than if it were all earthed over at once to its full depth. If the beds should heat too violently after the plants are in, the roots of them can be more readily prevented from sustaining injury, by drawing the mould away from round the sides and from under the bottoms of the hills, and supplying the place with fresh mould.

The beds being thus finished, in two or three days they will

be, in ordinary cases, fit for the reception of the plants. The plants, as directed in January, being planted into pots, three plants in each, the strongest and most stocky should now be chosen, and removed carefully from the seed or nursing-frame in a box or basket, covered over so as to prevent any accident in their removal from one frame to the other. The day previously to this final planting out, the plants in pots should have been gently watered, which will render the balls of mould round their roots less liable to fall in pieces when turned out of them.

They should now be carefully turned out of the pots and planted in the hills, one pot of plants, that is, three plants into each hill; draw the mould gently round their stems, and let them be planted rather deep than otherwise. The plants being thus planted, give the hills a gentle watering with a fine-rose watering-pot, sufficiently to settle the mould round their roots. This water, as should all such that is used for watering either cucumber or melon-plants at this early season, should be warmed, either by being placed in the frame the day preceding that on which it is used, or it may be rendered sufficiently warm by the addition of water warmed for the purpose, and brought as near to the temperature of the bed as possible. The process of planting or *ridging* out being thus finished, shut up the lights, till the steam rises again strong enough to require to be let out by degrees.

Whether cucumbers or melons be cultivated in common dung-bed frames, or in pits of whatever construction, the principle of temperature, planting out, &c., are the same, with this difference only, that some pits are so constructed that only a small portion of steam from the fermenting matter, either under them or from the linings by which they are heated, can enter into the bed. This deficiency of steam must be supplied by sprinkling water on the flues when they are sufficiently heated. Both cucumber and melon-plants thrive much better in a humid high temperature than in one that is dry, however warm it may be; therefore the more they can be supplied with that heat and humidity, the more likely are we to be successful in their production.

The plants being ridged out, care must be taken to supply them with air every day, in a greater or less quantity, as the weather and state of the beds may determine. In giving air at this season, great caution is required, so that too much is not given at once, as to chill the frame, and that it be prevented from blowing in too great a quantity at once, particularly when it is frosty or cold, and coming into immediate contact with the plants; to prevent this evil, it is well to hang pieces of old thin mats over the openings, so that the current of air blowing through the mats may be broken before it reach the plants. Steam will now abound, particularly during night, if the beds be of sufficient warmth; this, although highly necessary for the welfare of the plants, must not be suffered to abound too much so as to injure them, it will therefore be often necessary to leave open a small portion for the admission of air during the night, for the more ready escape of the steam; however, it will always be necessary to let the ends of the mats with which they are covered hang over such openings, to prevent the entrance of cold or frosty air into the beds. These mats must, however, be so placed, as to be quite clear of the linings; for if they be let too low down, they will conduct the noxious rank steam from them into the beds, and will, if such be permitted to any extent, destroy the plants.

The principal object now to be attended to, is to support a constant steady growing heat in the bed, so as to keep the plants from sustaining any check in their growth. To attain a sufficiency of heat, it is necessary to attend to the heat of the bed; and when the first symptom of its declining appears, let linings of prepared hot dung be applied, sufficiently strong to re-invigorate the declining heat of the bed. If the weather be moderately mild, and the materials of which the beds are formed be good, a little protection laid round the sides of the bed, of dry straw, bean-haulm, fern-fronds, or the like, not of themselves to throw any heat into the bed, but to protect it from the external cold air or cutting winds, may yet be sufficient. This precaution being applied in proper time, the heat may be sufficiently retained in the beds for some days longer, and the necessity of applying the linings of hot dung

may therefore be postponed a little longer; but too much dependence should not be placed upon this covering; for if the bed once becomes cold, the plants will sustain a very serious injury before it is possible to get up the temperature again sufficiently strong. Should the linings, when applied, at any time raise too much heat into the bed, they can be drawn a little back all round the frame, so as to allow the escape of their heat, and be again placed close when it is necessary to admit greater heat.

A bed properly put up, if of good materials, should last, with a little protection, as hinted at above, for three weeks, but seldom longer at this season. Without the aid of linings, it will often happen, however, that beds of excellent materials will not retain a sufficient heat so long. At all times, and under all circumstances, this is only to be ascertained by a daily examination of the beds.

For the first three or four weeks after planting out, great attention should be paid that the roots of the plants sustain no injury from over-heats; for it not unfrequently happens, that beds put up for some time, and when even earthed all over to their full depth, will heat a second time so violently, as to render the plants, when even well established, in great danger of being burnt at their roots. To guard more effectually against such accidents, many persons place a piece of turf under the hills before they are formed, and this precaution may be attended to as the trouble is not great; but the most effectual means of preventing burning at the roots, is by a daily examination of the mould at their roots: when that appears dried up, or has too much heat in it, which can be always readily ascertained by thrusting in the hand, the mould so dried, or over-heated, should be gently removed, and replaced with fresh, as already observed. The hills may also be reduced as much as possible, leaving them just sufficient basis to stand upon, without danger of falling; in this state they may remain till all danger of burning be over, when the mould may be again replaced to their original size.

If every thing has succeeded, in the course of eight or ten days the young roots will be beginning to show themselves all round the hills: this is looked upon as the first symptom of

the plants being in a state of progressive welfare. When such roots appear, let a little mould be laid over them, to the thickness of three-quarters of an inch, or an inch and a half at most. Such mould should be of the same quality as that of which the hills are formed, and for this purpose should have been in the bed for a day or two, so as to have attained a temperature equal to that of the rest of the mould in the frame. It is well not to put too much of this mould round the roots at once; a little should only be put at a time, and that often repeated, and upon the appearance of the roots this should not be neglected. Towards the end of the month, if the plants were planted out towards the beginning, the shoots will be making fast progress; and if the first bud, while yet in its embryo state, was picked out at the time of potting-off, or, if not then done, when they were ridged out, one, two, or probably three shoots will now be formed, which, as they advance, should be stopped; that is, by pinching off the point of each shoot a little above the first or second eye or bud: this will cause them to throw out lateral shoots, and from the first or second joints of such lateral shoots, fruit will most probably show. If such should not, however, be the case, these shoots, in their turn, should be topped or shortened in like manner, and so on until fruit or female flowers appear. This will not only throw the plants into a state of greater fruitfulness, but will also render the plants more strong and stocky. Such runners now formed by this first pruning, will most probably show fruit at their first, second, and third joints. In many cases, where the principal shoot or runner is not thus stopped, it will probably run three, four, or six feet, without showing fruit, or without throwing out side or lateral shoots to fill the bed with vines. As the vines (as they are technically termed) or runners proceed in their growth, let them be stopped when running too far without showing fruit; and as they advance, be neatly and regularly trained down to the surface of the mould by small hooked pegs, to keep them in their respective places, and keep them close to the mould, so that, as they advance, they may emit roots to strengthen themselves and afford nourishment to the fruit.

No further pruning will be necessary for them until they are

in a bearing state, except any vines, which appear weak or ill-placed, or where they may be too much crowded, such only should be entirely displaced. When it becomes necessary to remove any such shoots, pinch them neatly off with the finger and thumb, in preference to using the knife; but if the knife should be used, let the shoot so amputated be bruised between the finger and thumb, so as to stop or prevent too great a share of sap, or in other words, the blood of the plants, from escaping.

If the plants have been well managed, and no accident has taken place, fruit will be showing in abundance upon the cucumber plants. The melons, from their nature, will not show for some time yet, most generally some weeks afterwards. When the female flowers appear, which will be readily distinguished from the male flower, the former always having at their base the rudiments of the future fruit, the latter having no such appendage, but merely a simple flower containing the stamina, with the fertilizing dust, pollen, or farina, covering the tips of the stamina or male parts of fructification. When such flowers appear, the important office of assisting impregnation falls to the care of the cultivator, and should not be neglected.

The work of impregnation, or *setting* the fruit, as it is technically called, is, as Abercromby very justly observes, a most important operation of art incumbent on the gardener, particularly in the early cultivation of these plants, while wholly confined in frames, as at this time the operations of nature are almost excluded. This should be done accordingly as the flowers, both male and female, come into full bloom; and it is performed by injecting the farina or male dust into the stigma or female part of the fructification. Plants, which contain the male and female parts of fructification within the same flower, and are hence called *hermaphrodites*, do not require in most cases this care; but such as have these organs placed in different flowers, are therefore less likely to be fecundated without artificial means, particularly when confined in the close atmosphere of a common hot-bed, and at so early a period of the year when few or no insects are in existence to carry the impregnating matter from one flower to another. Such plants

are called *monœcious* plants, from the circumstance of their respective organs being placed each in one distinct flower. Unless the female flower, which generally carries at its base the rudiments of the young fruit, be impregnated with the pollen or farina of the male, the young fruit will constantly turn yellow, and drop soon after they have flowered.

In summer, when the plants are fully exposed, the gentle breezes of wind, and the different winged insects roaming from flower to flower, carrying upon their wings the fertilizing dust from one flower to another, will, for the most part, perform this office without the care of the cultivator. But in spring, and during the winter months in particular, when small portions of air can only be admitted, and when no bees or other flying insects inhabit the frames, the necessity of artificial impregnation becomes absolutely necessary, by carrying the male to the female blossoms in the following manner:—

At the time when the flowers of both sexes are fully expanded, or the day after at farthest, the male blossoms, which are easily distinguished from the female, as noticed above, (no appearance whatever being shown of their having the rudiments of fruit attached to their base,) gather such of the best male blossoms as appear strong, and with them a portion of the peduncle or flower-stalk, about an inch in length, by which to hold the flower in one hand, while with the other pull off the petals or corolla (*the colored leaves of the flower*) carefully from about the stamina and antheræ; then, still holding the flower by the peduncle between the finger and thumb, apply the antheræ, or top of the stamina, to the centre of the three stigmata of the female flower, and turn it about two or three times, that it may discharge or inject a sufficient portion of the pollen or farina into the said stigmata or female organs, and then throw it away, using a fresh male flower for every female one operated upon, unless the male blossoms be scarce, (but this is seldom the case,) when one male flower may be sufficient for several females.

It may sometimes occur early in the season, that female flowers may appear when there are no male ones wherewith to impregnate them; this would be a mortifying circumstance indeed, and recourse must then be had to other plants in the

same gardens; but if it should so happen that there are none, in this case male flowers may be brought from a distance, carefully packed up in paper, and kept quite dry; and with them, the important office may be performed. Some gardeners leave the male flowers attached to the female until they drop out of their own accord; but this is unnecessary, for if both blossoms be fully formed, the office of impregnation will be completely performed in a few seconds. The middle of the day should always be preferred for this purpose. If there be a brisk growing heat in the beds, the fruit will, in a few days after impregnation, show evident signs of the approaching maturity. If the beds be in good management, and the fruit of a good kind, the blossom will continue attached to the fruit, often till it be fit for use, which is, when they are from five to six inches long. Some kinds will grow so rapidly, under excellent management, as to attain the length of twelve or fifteen inches with it still attached to them. Early in the season, it should be an established rule to set every promising flower as it comes into full bloom; and the critical moment seems to be the early part of the first day on which the blossom opens. Water should not be given them immediately after the setting of the blossom. The male blossoms often grow in large clusters upon the vines, and these should be thinned out, leaving a sufficient number only to ensure the setting of the crop. These should not, however, be entirely removed, as without them there would be no fruit. As the blossom fades, it should be picked up and thrown out of the beds, as being apt to damp and injure the vines.

It will be necessary for successional crops of melons and cucumbers, as well as to guard against accidents which may attend the young plants now in seed-pans or potted-off, that a few seeds be occasionally sown in the frames or pits now at work. Such as were sown at the beginning of this month, will, under good management, be in fruit by the end of March or the beginning of April; and those sown about the middle or end of this month, will also be in fruit by the end of April, and will be in full bearing during May and June. Few cultivators sow melons for general crops before the beginning or middle of this month; as those sown sooner, if they withstand

the inclemency of the weather, will come into fruit before there be sufficient sun to give them a proper flavor. No fruit that we cultivate requires more of the influence of that soul of vegetable life than the melon. A bed or two, however, in large families, may be brought in sooner, but their flavor will not be so fine as those which are ripened during July and August. Such sorts only should be sown for the earliest crops as will require less time to come to perfection; and of these, the early Canteloupes are to be preferred. The directions hitherto given, as regard the sowing, potting-off, and ridging out of cucumbers, are also applicable to melons; with this difference only, that beds for the latter fruits should be built a foot at least higher, and a brisker heat kept up to them during their whole culture, and the mould in which they are grown should be much stronger than for cucumbers, and as it is added to their roots, it should be firmly trodden, so as to be as solid as possible; but care must be taken in doing this, that their roots be neither bruised nor broken in the process. When melons begin to show fruit, great attention should be paid to them, that the office of impregnation be not neglected; for although cucumbers will sometimes, even at this early period of the season, come to tolerable perfection without this assistance, and often afterwards, melons will not set freely at any period without it; and should they occasionally set and swell to an ordinary size, they never will acquire that beauty nor flavor which they would if impregnated; they will also often go off when half grown, and will always be deformed and without flavor.

FORCING STRAWBERRIES.

Successional crops of strawberries should be brought into the forcing department, both at the beginning and also at the end of the month. Where many pots are to be forced, and where a constant supply is wanted, attention should be paid to such as were taken in last month, and as they advance, let them be abundantly supplied with air and water; both of which are essentially necessary to them in every stage of their growth.

FORCING ASPARAGUS.

Successional beds should be prepared for asparagus, both at the beginning and also at the end of the month. (For directions see *last month*.)

FORCING FRENCH OR KIDNEY-BEANS.

Kidney-beans succeed well, if planted in large pots, and placed in any of the forcing-houses, where a sufficient temperature is kept up; that of the pine-stove is the best suited for their production. They should be sown in shallow pans or boxes, and when two or three inches high, transplanted into pots of one foot diameter at their top, three or four plants in each pot, and placed upon shelves as near the glass as possible, so that they may enjoy a sufficient share of light. In all situations, French-beans require a rich soil; for this purpose, the pots should be half filled with good rotten dung, and upon this the young plants should be placed, covering their roots an inch or two with rich light mould; and as they advance in growth, let fresh mould be added to their stems, until the pots be filled to the top. They should be liberally supplied with water at their roots, and often sprinkled over the top, as they are extremely liable to be infested with the red spider. As they advance in growth, they should be supported with small branches stuck round them, to prevent their being broken. In such situations, under ordinary good management, plentiful crops of this esteemed vegetable may be obtained during the greater part of the winter, and all the spring months, until they can be procured in the open borders. Sometimes pits and frames are used to produce this crop; but where there is the advantage of a pine-stove, they can be more conveniently procured.

M A R C H.

NURSING PINE-PLANTS.

In the course of this month, when the weather is fine, this department of the pinery will require to be examined, as was done to the fruiting-plants last month. The heat may now be on the decline, and require to be renewed, by trenching the whole bed over, and taking out such as may be much exhausted of the tan or leaves, and replacing it with fresh. The directions given for the fruiting-plants, as far as regards shifting the tan or leaves and replacing the plants, are applicable to the young pine-plants at this time. As the plants are taken out of the bed in which they are plunged, each should be neatly tied up with a piece of fresh matting, to prevent the leaves from being broken or injured, as well as for the greater convenience of handling them. In performing this operation, one person should gather up the leaves between his hands gently, so as not to pull the plants out of the pots, and hold them moderately tight, while another binds them up with fresh strings of matting; sometimes it is necessary to put two or even three several strings of matting round them, to keep up all their leaves. This should be particularly attended to at all times that the plants are removed; for, without this precaution, the leaves would be unavoidably broken, bruised, or otherwise injured, and the operators would not be able to perform the potting, &c., with so much expedition if they were left untied. When it occurs that a plant stands loose in the pot, it then should be supported by a neat stick, which will prevent it from being farther loosened, and will be a certain sign of its requiring to be re-potted.

As a great many will require to be now shifted, it will be necessary to have in readiness a sufficient quantity of proper mould, prepared previously, and kept dry in a shade for this purpose, as well as a sufficient number of pots, of the different sizes likely to be required, to suit the size and circumstances of the plants. All things being in readiness, the plants should

be examined, and all that require shifting should be selected and turned out of the pots, carefully placing one hand level with the surface of the mould in the pots, with the stem of the plant between the fingers, while with the other hand take the pot by the bottom, and invert it, striking the margin of the pot upon the edge of the potting-bench, so as to shake out the ball entire. The balls that are much exhausted at this time, should be carefully broken, and the roots singled out, and such as are decayed cut off, as well as some of the less strong and unhealthy roots; the decayed leaves round the stem should also be displaced, which will encourage the plants to push out fresh roots near the surface of the pot. The sizes of the pots used must be entirely regulated by the size and strength of the plants; for it is an erroneous notion that they should be shifted into pots bearing any proportion to those out of which they were taken. All strong growing healthy plants should be placed in pots of larger size, and such as are weak, ill-rooted, or sickly, should be put into pots of the same size as those from which they were taken, and, in some cases, in pots much less. The smaller the pots into which weak plants are put, the more likely are they to become strong. Fresh pots should be used for the plants which are shifted; and by no means use such as have been recently emptied, until they have lain for some time to sweeten. The pots should also be dry, and have (if not new) been previously cleaned. In potting plants of any kind, avoid using pots too large, for it is much better to shift the plants again in a month or six weeks, than to over-pot them at once. In draining the pots, use oyster-shells, if they can be conveniently procured: place one of them on the bottom of each pot, over the hole, with the concave side undermost; they will prevent the entrance of worms, which often become troublesome to pine-plants, particularly when the bed in which they are plunged becomes too far exhausted. Over the oyster-shell place an inch of broken pieces of pots, or brick-bats broken small, and over this place an-inch of half-rotten turf from the surface of some rich down, or sheep-walk; the broken tiles or brick-bats will act as a drain, to admit of the escape of any superfluous moisture; and being themselves of an absorbent nature, they will imbibe a share of moisture,

which they will impart to the roots when they enter among them. The rotten turf will also afford additional nourishment to the roots, and will prevent the drain under them from being choked up by the finer earthy particles washed down in the process of watering. The roots seem to delight in entwining round the broken fragments of pots, or small pieces of bricks, and will be found, upon examination, to be always in a healthy state, in proportion as these abound in the pots. For larger pots, a greater depth of these fragments should be used, in proportion to the size of the pots. In potting the plants, after the roots are all separated and trimmed, place a handful of mould in the bottom of the pot over the rotten turf, upon which place the plant; and while it is held upright by one hand, with the other fill the pot with mould up to the top, pulling up the plant occasionally, so as to allow the mould to fill all the spaces amongst the roots, as well as to place it at a proper depth in the pot. When it is full of mould, beat the pot upon the potting-bench two or three times, so as to shake the mould more compactly together; do not press the mould too tightly together with the hand, particularly if it be damp; a very slight pressure round the surface will be sufficient, and that merely to regulate the mould to a proper depth under the level of the margin of the pot, so as to leave a space for the purpose of holding water. The plants being potted, give them a slight watering at their roots, merely to settle the mould about them; a more general watering will be given when they are again placed in the bed.

Presuming the bed to be now in readiness for them, which should have been preparing while the shifting of the plants was going on, proceed exactly in the same manner to replunge them, as was directed last month for the fruiting-plants, beginning with the largest and tallest plants in the back row, and so proceeding until the whole be again replaced in the bed; the smaller and sometimes the unpotted crowns and suckers occupying the rows next the front, not only that they may enjoy more light and air, but also be more conveniently got at in the course of the succeeding month, when many of them will require to be potted in mould, and being thus placed in the front, they can be conveniently got at without disturbing

the arrangement of the whole. When the process of plunging is finished, clean out the interior of the house, and leave it in a neat and orderly state. Go over the plants with a sharp knife, and holding the pieces of matting which were used to tie up the plants between the edge of the knife and the thumb, cut them through, and remove them, regulating any leaves that may happen to lie in an irregular position, drawing the hand gently up between them, they will then fall down in their natural position; and this being done, give the whole a good watering at their roots, and in the course of another day or two, if the weather be clear and dry, give the plants a good washing over-head from the syringe, to clear them of the dust or filth which they may have contracted during their shifting.

The plants will now be beginning to grow; the temperature should therefore be kept up to 70° , the times of regulation being generally at six o'clock in the morning and at eight or nine at night. As the weather will now be getting more temperate, and the plants be in a state of active vegetation, air must be admitted during the forenoon of every day copiously. The health of the plants now depends upon a free admission of air, plenty of water at their roots, and frequently over-head, with a steady degree of temperature. The thermometer in the hottest sunshine should not be allowed to exceed 90° , but be kept at and under that point, by the admission of plenty of air. As the plants get established in their pots, and are growing rapidly, every third or fourth day, water should be given at their roots in ordinary quantities; and if occasionally richly impregnated with sheep-dung, the plants will be thereby greatly benefited. Attention should now be particularly paid to the regular steaming of the house every morning and evening, by pouring water upon the flues and floors of the house; indeed, a moist and high temperature from this time till autumn, seems to be the most congenial atmosphere for pines to live in, and in such a climate few insects will visit them.

SUCCESSION PINE-PLANTS.

This department will also now require a similar regulation, as above directed for the nursing-pit. The plants being taken

out, tied, and examined according to the preceding directions, such as require to be shifted should be done in the same way, and placed in pots corresponding in size to their respective sizes and growths; observing not to pot them in too large pots, but rather to calculate upon again shifting them in April or May. Indeed, no such thing as a regular and indiscriminate shifting should take place at any time; for circumstances occur so often in the habits and constitutions of plants, that to attempt to shift them at stated periods, and into certain sized pots, only defeats the object in view. All plants should be provided with larger pots and more nourishment just as they stand in need of it. It is often of much advantage to plants to be taken out of the pot in which they grow, and replaced into one of the same size, and not unfrequently into one of lesser size. The size of the pots must always be left to the good sense of the cultivator. It is, however, of more injury to them to be over than under-potted. In large pots, plants become cloyed with too much nourishment; and as the plant, by its absorbent organs, is unable to extract all the nourishment contained in a large pot, it soon stagnates and becomes sour by being kept too damp, particularly when plunged; as in that state the superfluous water is prevented from passing off through the sides of the pot, which would not be so sensibly the case, if the pot stood exposed on all sides. It is a well-known fact to cultivators, that all plants strike roots most readily when placed next the sides of the pots in which they are planted; and many plants, that cannot be induced by almost any other means to strike root, will emit them by cuttings, when the base of such cuttings rests upon the bottom of the pots, without the least particle of mould intervening. In order, therefore, to procure healthy rapid growing plants, which is the ambition of every pine cultivator, it is necessary to induce them to multiply their roots, and no method appears so rational as growing them in small pots; and as they advance in growth, continue to shift them into larger, taking care not to injure the roots in the operation, but to continue them in a growing state. The plants being shifted, according to their several necessities, they are then to be re-plunged in the same manner as directed for

the fruiting-plants last month, observing to give them plenty of room in the bed, that they may enjoy sufficiency of air and sunshine. The temperature should be kept as steadily as possible from 65° to 70° , and air should be admitted daily, in proportion to the state of the weather; and should the air of the pits become low, in consequence, for a few hours, it will be of far less injury to the plants than if kept more uniform and the stagnant air allowed to remain unchanged.

FRUITING PINE-PLANTS.

This department being regulated as directed in February, little else will require to be done than supplying them with fresh air and plenty of water, both at their roots and also over-head in clear weather, never allowing the steaming to be neglected every morning and evening. There is something so congenial in a fine humid atmosphere to the nature of the pine, that it is seldom found in perfection where this practice is entirely disregarded; and no method appears to us to produce this humidity so readily as that of creating a steam from the flues by pouring water upon them. The plants should occasionally be watered at their roots with liquid manure; as from this time, until they have swelled their fruit nearly to its full size, they will require every nourishment which can possibly be given to them. As they proceed in the formation of their fruit, they will be materially assisted by forming a ring of turf, equal in circumference to that of the pots in which they are placed, two or three inches thick, and this part should be placed upon the top of the pots, and thereby, as it were, increasing their size. The hollow formed by this addition to their size, should be filled up with rich maiden loam, and sheep or other rich dung well incorporated, and this top dressing will encourage them to emit fresh roots from the bottom of their stem, upon which, if there be any useless or decaying leaves, they should be removed; by which means the emission of such roots is facilitated. The temperature of the house should now be gradually raised to 73° or 76° , allowing the temperature in sunshine to rise to 80° , and from that to 90° , during the middle of the day, but not to exceed 90° as a

maximum. If the weather be dull and cloudy, it may be necessary, by aid of fire-heat through the day, to raise the temperature at least to 80° ; at which it can be regulated for a few hours daily by the admission of air. It is necessary thus far to imitate nature by keeping the temperature throughout the day, either by sun or fire-heat, several degrees above the night temperature; for nothing can be so injurious to any plant in an artificial climate, as to keep up a high temperature during the night, and upon the first sight of the rise of temperature by sun-heat to throw open the house, thereby keeping nearly an equality of temperature day and night, or rather keeping the temperature of the night higher several degrees than that of the day, whereas the very opposite ought to be the case. This circumstance was not unnoticed by that great physiologist Mr. Knight, when his attention was particularly directed to pine growing; and his observations upon this very subject, are more rational and just than almost any other of his directions for cultivating the pine.

FORCING PEACHES.

By the beginning of this month the peach-trees will be in blossom, if the directions laid down in the preceding months have been properly attended to. The temperature now should be gradually raised from 52° to 55° , at which point it should stand about the second week in the month, and remain at that temperature during the remainder of the month. Air should now be freely admitted to strengthen the peach-blossom, and ensure their setting, not only by adding to them strength, but also by assisting in the dispersion of the farina, or male fertilizing dust of the anthers, or male parts of the fructification, upon the female organs; for without such impregnation the blossom would prove abortive, and no fruit would consequently follow. The trees, during the period that their blossom is expanded, cannot be supplied with water by the syringe so bountifully as previous to their expansion, therefore the steaming of the house should not be neglected; for although any superabundant supply of water, either at their roots or over their branches, would materially injure the more delicate

parts of the fructification, a dry close atmosphere would be equally injurious. The fine dews produced by the simple operation of steaming, will keep the plants in vigour and strengthen their bloom, until the fruit be set, which will be accomplished in a few days after the blossom has attained its full size, and will be readily ascertained by the young fruit appearing like a small swelling at the base of the style, or female organ. All the blossoms in the house will not, however, set at the very same time, a few days allowance must be made for such parts as are more remote from the glass or heat; but when the fruit has evidently set, the application of the syringe should be again had recourse to. The first two or three days of syringing, the quantity given should not be large, and should be applied with the finest cap upon the syringe, so as to resemble a strong dew more than a rain. When all danger is over of injuring the young fruit, or the late expanding blossom, the second coarser cap should be put upon the syringe, and the water given with some force to displace the remains of the decayed bloom, and to clear the trees of dust and the first symptoms of insects, which will be sure to make their appearance before the leaves have attained half their size. It is of much consequence to suppress these intruders at as early a period as possible; thereby preventing them from getting a-head and injuring the trees in their most tender state.

The red spider will be entirely subdued and completely kept under, by a timely and unsparing application of water from the syringe, using it from the right-hand end of the house, and again from the left, so that both sides of all the leaves may be subjected to its effects; this will destroy those which are already formed, and so completely derange their webs upon the back of the leaves, that they will not be likely again to make their appearance; and should they even gain possession, a little sulphur may be sprinkled upon the flues when at the greatest heat; but this must be done with great caution, from fear of injuring the tender foliage. It is generally the few days on which the watering is suspended in consequence of the bloom, that enables the spider to burst into existence, while the leaves are rather dry; but after the watering is resumed, it will be an evident sign of a deficiency of that element if the insect

makes its appearance again, at least until the watering be again suspended, while the fruit is ripening. When it makes its appearance only in parts of the house, and not generally, a little sulphur may be ignited under the parts affected; but, as remarked above, this must not be done in a careless manner.

The green fly will also make its appearance, whether the watering be supplied in sufficient abundance or not; and such as are left, after being once picked over, (such shoots being as well removed, if they can be spared, after being once attacked by them) will be readily destroyed by fumigation with tobacco. As prevention is always much better than the best remedy, it will be adviseable to give the trees a slight fumigation twice a week, from the time the first wood-buds break into leaf until all danger of their attacks be over, which generally takes place when the leaves have attained their full size, and are become rather hard and strong, the tips of the shoots then only being subject to these enemies, which can in many cases be cleared by the hand; or the evil may be remedied by applying a little smoke from a common tobacco-pipe, blowing it from the bowl close to the shoot infected, or from the fumigating bellows.

When the young fruit has attained the size of full-grown peas, the process of disbudding should be attended to, for which see *The Fruit Garden*. No thinning, however, of the fruit need take place this month, at least not until the end of it. Water must not yet be too profusely given to the roots until the fruit has begun to take its first swelling, as it is generally termed by gardeners, and even then, not in so great a quantity as to sour the borders or keep the roots too damp; for, until the fruit has formed their stones or kernels, any unnecessary supply of moisture would be apt to make them drop off. The borders, if not mulched with rotten dung, should once a week be watered with the draining of the dunghill, or liquid manure; and this being moderately supplied, in addition to such as falls from the trees in syringing, and from the flues while steaming, will generally be found sufficient, unless near the flues, which should be kept moist.

FORCING VINES.

The directions laid down for the management of this department last month being adhered to, the same should be continued until the vines come into bloom. After that time, the temperature should be increased to 75° ; and the process of watering the borders and steaming the house, by pouring water upon the warm flues, should now be particularly attended to, so as to keep the house in rather a damp than a dry state. As vines are found to set their fruit best in a high temperature and moist atmosphere, the steaming becomes therefore the more necessary, particularly at this time, as it would be dangerous to use the syringe upon their branches until the fruit be set. The parts of fructification in vines are so small, that to an inattentive observer they are out of flower, and their fruit set before they are remarked; the application, therefore, of water by a syringe, or in any other manner than by a process of steaming, would be liable to injure, if not totally destroy the tender parts of the blossom.

Air need not be so freely admitted now as formerly, nor as will be necessary at a future period; a moderate circulation by the sashes or by the ventilators will be quite sufficient, observing to admit it only by small openings in cold windy weather. Ventilation is not best effected by opening the sashes or ventilators at any time, to any great extent, for if the top part of the sashes or top ventilators be only opened a few inches, and the lower ones in about the same proportion, the heated air, which is confined chiefly to the top of the house, will rapidly escape, as, in consequence of its being heated, it is much lighter than that of the atmosphere, and the atmospheric air will rush in from the front or lower ventilators, to fill up the vacuum produced by the escape of that which is lighter, and which has escaped at the top of the houses. Thus a sufficient change of air is effected without opening the house at any time to any great extent.

As the young shoots advance, they must be regularly examined and pruned; those which have pushed a few joints, and have shown one or two bunches, should be stopped at

the second joint above the fruit; which stopping is performed by pinching the tender shoot asunder with the finger and thumb. All necessary pruning in the vinery or peach-house during summer, is to be effected in a similar manner without using the knife, by which a bruised wound is produced, which is not so apt to bleed as one which is produced by the cut of a knife. It is on this principle that gardeners are in the constant habit of bruising the shoots of melons and cucumbers with the finger and thumb, after pruning them with a knife, to answer the same purpose; and this method seems to have been practised for an unknown length of time. Such shoots as produce no fruit, and are not intended to be retained for a supply of young bearing-wood for the succeeding year, are to be rubbed off quite close to the old wood from which they issued: thus clearing the vines of all superfluous and useless wood, which, if not removed, would rob the necessary wood left for succeeding purposes, as well as materially injure the crop, and cause a great degree of confusion.

The shoots to be chosen for the production of the crop next season, should be now selected from the strongest and best-formed shoots having no fruit, and which, from their luxuriant appearance, are likely to attain considerable size: these should be tied into the trellis as they advance in growth, to prevent them being broken, and so arranged as not to crowd the rest of the shoots of the vines. All shoots that spring from the old wood should be entirely displaced, as well as some of the more weak of those which have shown bunches of fruit, if there be plenty of stronger near them, so as to prevent all unnecessary confusion and shade. The vines will require to be gone over every other day, until all the shoots have extended so far as to determine whether they are to produce fruit or not; and this examination will require to be continued for some time after the fruit has set, as such shoots which have been shortened will be apt to throw out lateral or side shoots, which should be removed above their first joint from the fruit-bearing branch.

In tying the fruit-bearing shoots to the trellis, but more particularly the shoots intended to remain for next season, observe to allow plenty of room in the matting to allow the

shoots swelling to twice the size which they may have now attained. The tendrils, which are meant by nature for the vines to support themselves when growing naturally, are useless in the vinery, and only tend to create confusion, they should therefore be all pinched off, in order that they may not rob the fruit of any of their nourishment.

The opinions of practical and experimental men differ widely in regard to the best mode of training the vine; but in whatever way it is or can be trained, it is of much less consequence to the production of good crops than its other general management. To have good grapes, much more depends upon the soil in which they are planted, and the climate in which they are kept, than in any particular mode of training. That mode which tends the least to confusion, and at the same time admits of a constant supply of young bearing shoots into the vinery, is decidedly the best, every advantage being combined in it; while, at the same time, it is exempt from that confusion which attends other methods of late years extolled by horticultural writers, and which are not calculated to produce any better effect. A greater variety of training may be indulged in on the open walls; but as the object in all vineries is fruit of the best quality, we see no better method than training the shoots directly up the roof, for, by this means, a good gardener will always be able to provide a regular supply of young wood in every part of his house; whereas a novice may adopt any plan which he fancies, without attaining the desired object.

FORCING CUCUMBERS AND MELONS.

The cucumber and melon-plants now showing fruit, will require great care and attention, as advised last month. Particular care must be paid to set or impregnate all female flowers as they appear; for, without this assistance, many would damp off, and others would grow of a deformed shape, for want of that necessary assistance. This is more particularly to be attended to as regards melons; few, if any of them, will come to perfection without being impregnated. At a more advanced

period of the year, this precaution is of less importance, particularly to cucumbers, as many insects, and bees in particular, will be in active quest of food, and will, while flying from flower to flower, perform this necessary office. The state of the beds will require daily attention, so that a brisk growing heat may be kept up, in order that the plants may not sustain any check, which to them, at all seasons, is extremely injurious. This heat, though brisk, must be moderated according to the state of the weather. The cucumber-plants ridged out last month, as directed, will now be beginning to produce fruit in perfection and abundance.

As the heat begins to decline, let linings of prepared fresh dung be applied, or the linings, if any have already been applied, should be renewed as circumstances may direct.

Air should be freely admitted every day, in quantity more or less, as the state of the weather and the temperature of the beds may direct; and water should be likewise administered frequently, but in a moderate quantity, always using the precaution to have the chill taken off before using, either by its being placed in the beds some hours previously to its being used, or rather by the addition of a portion of water heated for the purpose. The operation of watering should be performed in the forenoon, and, if possible, in fine days, from ten to one o'clock, so that the plants may be partially dried before the beds are shut up for the night. The frames will require to be carefully covered up every night with mats, and this covering removed by sunrise, or soon after, in the mornings. As the plants extend themselves, let their branches or runners, as they are called, be pegged down to the mould, at regular distances, to prevent their running into confusion, as well as to strengthen the plants, by allowing them to root at the joints of their shoots, by which means they will obtain additional nourishment. As the roots penetrate through the hills, add more mould to them, always adding a little at a time, and having it placed in the beds a day or two before it is applied to the roots, so that it may be brought to an equal temperature to the mould in the beds.

It is of much consequence that the mould applied at all

times be well broken, and moderately dry, before it is brought into the beds ; for which purpose, it should be kept in a dry shed, or other sheltered place, to be always in a fit state.

The melon-plants planted at the same time will not be so forward as the cucumbers, but they will now, if every thing has prospered, be in want of additional mould at their roots, and their runners will, as they extend themselves, require to be pegged down in the same manner ; accordingly as the mould is applied to the melon-plants, let it be well trodden or beaten compactly round their roots, and let all appearance of mouldiness or damp be removed, by frequently stirring the surface, and displacing any dead or injured leaves. As the flowers are set or impregnated, let a small piece of tile or slate be placed under the rudiment of each fruit, which will greatly prevent their damping off.

Successional crops of both cucumbers and melons will also now be required to be ridged out from plants raised from seeds sown last month ; accordingly, as such plants appear fit for planting out, let beds be prepared for their reception, as directed last month, and for latter crops, seeds should now again be sown, at least twice during this month. Beds made from this time forthwith, need not be so strong as those already put up ; from three to three feet and a half will be quite sufficient.

For those who only desire to have cucumbers or melons to cut by the beginning of May, or towards the middle or latter end of that month and the beginning of June, this is a good time to sow the seeds, and the success of those which are sown at this time, may be calculated upon with greater certainty than upon those which are sown much earlier. For general crops for summer use, this is the best time to sow, as those which are sown at this time will continue bearing the greatest part of the summer and autumn months ; the cucumbers coming in, in June, and the melons in July and August : the only months in which melons can really be had in perfection. Towards the end of the month, seeds of both these fruits may be sown, for the purpose of being ultimately planted out under hand or bell-glasses. The plants from seeds sown at that time will be fit to plant out, where they are to remain, by

the beginning of May, and the cucumbers be fit for use in June and July, and the melons will be ripe in August.

HOT-BEDS FOR FORWARDING CULINARY PRODUCTIONS.

Slight hot-beds of leaves, or dung and leaves, may, by the beginning of the month, be put up for forwarding early crops of potatoes, carrots, French-beans, cauliflower-plants, celery, broccoli, &c. The potatoes, turnips, and carrots, to be left to produce their crops upon the beds, and the French-beans, cauliflower, broccoli, celery, &c., to be transplanted into the open borders to come to perfection. If the autumn-sown crops of peas or beans have failed, they should, by the beginning of this month, be forwarded upon slight beds in the same manner; and as these crops are found to be improved by transplanting, the loss may be readily remedied. In sowing peas upon hot-beds, cover the bed with turf cut into small pieces, as hinted at in the Culinary Garden, which will enable the operator to remove them from the bed to their place of intended growth, without injuring their roots or checking their growth. Capsicums, basil, gourds, vegetable-marrow, lettuce, love-apple or tomato, marjoram, savory, &c., should now be sown upon slight hot-beds, to be forwarded in their growth, and to be afterwards transplanted out into situations suited to their respective habits.

FORCING SALADS, &c.

Radishes of different sorts, mustard, cress, rape, chervil, and all kinds of salad-herbs, should be sown in succession upon slight beds till the beginning of April, after which time they will succeed sufficiently well in the open air.

FORCING MUSHROOMS.

Mushroom-beds may be now put up in the mushroom-house, or indeed at any time in the year; however, this month and September are generally preferred for that purpose. (For *Mushrooms*, see *Culinary Garden*.)

A P R I L.

NURSING AND SUCCESSION PINE-PLANTS.

The plants will now be in a rapid state of vegetation, and will require plenty of water at their roots, once in three or four days, occasionally giving them a supply of liquid manure, as already directed. They should also be frequently syringed over-head with clear water, both to refresh their foliage and to keep them clear of dust. The constant steaming of the pits should also be attended to. The temperature should be continued as regularly as possible, at the same degrees as directed last month. Air must be freely admitted at all times that the state of the weather will permit; and if any of the plants, which were not shifted into larger pots last month, appear now to be in want of removal, they should be carefully taken out and the required shifting given to them, and afterwards replaced in the bed.

FRUITING PINE-PLANTS.

Water at the roots must now be given in a plentiful manner, every second or third day, in order to swell off the fruit to a good size. The application of liquid manure should also be given once a week; but when this is applied, it is to be understood as answering the purpose of watering. If any of the pots that appear to require it, were left last month without a top dressing, as there recommended, it should now be done, particularly when the pots happen to be too small for any of the plants, or where there is a particular fine fruit upon a weak plant. This addition to the nourishment of the plants will be obvious, and is the only means of assisting them in that respect at this period of their growth, as shifting them might be attended with danger, and the roots will now probably have penetrated through the holes in the bottom of the pots, and have extended themselves considerably in the de-

composed tan or leaves of which the bed is composed. The plants have not only now to support their fruit, but also to nourish suckers, which will be fast forming, and which, when formed, make rapid progress in their growth; as these suckers are one of the modes by which the pine propagates itself, they cannot be dispensed with, unless on particular occasions, such as that of an unusually fine fruit appearing; in such a case, the lesser evil may be chosen, namely, that of destroying the offspring suckers, in order to promote the growth of the fruit. This is, however, seldom done, at least to any extent; the young plants always being considered valuable. Some varieties of pines are liable to produce small suckers upon the foot-stalk of the fruit, which, as they seldom are of much value, should be rubbed off as they appear; for, if left on, they would rob the fruit of a considerable portion of nourishment. The different varieties of sugar-loaf, the king, and the brown Antigua are particularly apt to produce small suckers of this kind; and these have been by gardeners denominated *gills*. When more than two or three suckers appear upon one plant, which has a large fruit, it is advisable to destroy them, as the increased size of the fruit, and the remaining two or three well-grown suckers will be sufficient produce from one plant. When the fruit is of inferior size, then the suckers may be permitted to remain to the number of six or seven; more than that cannot be well brought to perfection upon one plant. Such suckers as issue from the roots should be generally destroyed, as seldom making good plants. But if the increase of the stock of plants be the object, all suckers of the stem, and some of the best of those from the roots, should be encouraged. Those from the roots are more apt to start into fruit in a premature state, than those which are formed upon the stem of the plants, and are therefore of much less value.

Many gardeners prefer crowns to suckers, as making the best plants; others are of a different opinion; amongst the latter was Speechly, who was the most successful cultivator of this fruit in his day. "Suckers," he says, "are preferable to crowns, being generally of a much larger size; the goodness of either does not at all depend on the length of their leaves, but on the substance of their stems at the bottom. I have

sometimes had crowns that measured at their bottoms more than nine inches in circumference; and in such a case, they were almost equal to any suckers."

FORCING PEACHES.

The temperature should be continued as regular as possible at 55° of fire-heat, allowing an advance during the middle of each day by the sun-heat of 5° or 10° , but not exceeding that point. Air should now be more freely admitted, upon all occasions, by opening the sashes or ventilators, to prevent the young shoots being drawn up weak, and consequently unfit for forming buds for succeeding crops. This should be more attended to in the peach-house than in any other of the forcing departments, as the peach, from its habits, is impatient of close confinement; and the shoots, if drawn up weak, will become a prey both to insects and diseases more readily than vines or pines, which, being much more hardy in their nature, will not suffer so much nor so soon from those causes. The fruit should be thinned when of sufficient size to show the formation of the stone when cut through the middle, and before the stones have attained a grisly hardness. This thinning, however, should be cautiously pursued at this time, and the final thinning left until the stones be fairly formed.

When the trees assume a sickly or weak appearance, the quantity of fruit taken off should be greater, as by removing the superfluous fruit at an early period, the trees will consequently be less exhausted, and that portion of their strength, which they would naturally give to their fruit, be directed into their wood, and consequently the strength of the tree would be increased. This thinning of fruit of trees in a sickly or weak state is pointed out to us by nature, particularly in the case of the peach-tree. It is the first effort made by nature to recover itself, if reduced to a low weak state by immoderate bearing or in the case of bad management, by shedding more or less of its fruit, and sometimes the whole; and it is also observed in almost every other fruit-bearing tree, by shedding the superfluous fruit, which it finds it is unable to bring to perfection. Of this we are often apt to complain, par-

ticularly when they shed the greater part of their fruit; but nature is thus relieved, and that health restored or preserved, which, if the fruit had not fallen, would in many cases have rendered the tree for some years unfit for future crops, and probably deprived it of life altogether. Trees more strong and luxuriant than may be desirable, may be allowed to carry a greater crop to exhaust themselves to a certain degree, and thereby acquire habits of more moderate growth, which will be more likely to continue them in a regular fruitful state for years, than if allowed to continue in a gross state of growth. This cannot be effected by pruning away the shoots, as in that case it would only tend to produce greater luxuriance. Laying in more wood, pruning little, and taking larger crops off them than off such as are of less gross habits, will correct this habit of luxuriance in most trees.

The trees should be now disbudded or divested of all superfluous wood, leaving only such as will be really required to be laid in for the next year's crop. This early pruning will materially contribute to the health of the trees, and enable them to make such wood as will be productive of future crops, and give every chance of producing in high perfection the crops of the present year. This practice of disbudding is too little attended to by many gardeners, from a mistaken fear of taking too many off; but it is much better to have a few fine healthy shoots than to have the trees crowded with a vast number of meagre shoots not thicker than straws, and which will require to be cut out in the winter pruning, being unripened and weak, and all this at a considerable sacrifice of the strength of the trees. Those shoots which are selected to remain, should be neatly and regularly laid in to the trellis, and this should be done as they advance, to prevent them being broken by the effects of watering, or other accidents, besides giving the trees a much better appearance. In tying those branches to the trellis, care should be taken not to tie them too tight, but to allow as much room between the shoot and the matting as would admit of another shoot of the same size along with it. If this be not attended to, the shoot swelling in size will be confined for want of sufficient room, and the consequence will be, that the shoot will be cut almost through, and lay the

foundation of a disease of the most dangerous nature. Peaches, of all trees, are the most sensible of external injuries; and when the shoots are injured by this, or any other cause, bleeding ensues, and gum and canker follow.

Water may now, as the fruit advances, be more liberally supplied to their roots, but still (as remarked last month) with due caution. The operations of the syringe should go on with unremitting assiduity, to keep down that dreaded enemy the red spider, and to refresh and nourish the leaves. Steaming should also be attended to, for the same purpose. The green fly, if the hints given last month be duly attended to, by once or twice a week using a slight fumigation of tobacco, will be kept entirely down. If it be once allowed to get a-head, it will require three times the expense to subdue it, independently of the injury done to the trees.

The coccus sometimes makes its appearance, but (if not in immoderate quantities) it is apparently injurious; where, however, they can be removed, it is as well to do so, but their final removal will take place when the trees are undergoing their winter pruning and washing. The males of these insects having wings, may be dislodged by the application of water, thrown upon them with some force; but as the females are stationary, they can only be rubbed off with the finger, or by similar means.

PEACHES ON HOT WALLS.

Peaches are not unfrequently planted against hot walls, and where properly managed, they cannot but be considered as extremely useful, as forming that link of connexion between the forcing-houses and the open walls, and thus ensuring the ripening of the finer and later kinds of peaches and nectarines in cold wet autumns, in the most favourable situations, perfecting, at the same time, the earlier or middle-class of peaches and nectarines, in situations where the climate is not sufficiently congenial for their production without such assistance. All garden-walls of southern aspects, should be built hollow, or with flues, so that they can be used when occasion requires; and as there is no extra expense in the first erection,

such walls also should be so built that have eastern and western aspects also. These latter, however, will not be of general utility, unless in warm situations in the north, and in all situations in the south of England. This species of forcing has been practised by many to an injurious extent; and, instead of doing good, has done much harm to the trees, by an injudicious application of the means that otherwise would have been of the utmost benefit to them; for this reason, few hot walls have been built of late years, and many that have been so constructed have not been used.

Trees planted against hot walls are not to be considered as to be forced, but to be assisted in bad situations and unfavourable seasons. The failures, therefore, hitherto experienced, have originated in the want of due caution being paid to the times of applying heat and the quantity so applied.

“Fire-heat,” says Nicol, “should never be applied to naked walls in the spring, so as to force the plants, which should be allowed to vegetate of their own accord, to flower and to shoot. But, after vegetation has commenced, and when the flowers, foliage, and infant fruit are in a perilous state, if bad weather overtake them, the help of the flues may be called in, and they may be employed in an auxiliary manner for their defence. If further aided by the application of nets, or of canvas screens, (*see Protecting Blossoms, in Fruit Garden*) their mutual help might, with proper attention, be reckoned upon as the sure pledge of a crop, and of well-matured fruit. The fires, if any be made at this season, should be very moderate. The flues should never be heated so as to feel much warmer than the hand after being kept in the bosom for a few minutes; that is to say, they should seldom be above blood-heat, or what is termed milk-warm.”

Much injury may be done by attempting to force these trees placed with one side against a hot wall, while the other side is exposed to all the vicissitudes of the season. The greatest use of hot walls, and which is really of considerable importance, is their assistance in the end of August, September, October, and the beginning of November, in forwarding the maturation of the fruit, and ripening the wood. The trees upon such walls, if fire-heat be applied to them, will require to be plen-

tifully supplied with water during the whole time such heat is used, for the suppression of spiders and refreshing of the foliage.

Hollow walls, heated by Mr. Atkinson's hot-water system, will be much less liable to accidents from over-heating, as no such occurrence can possibly take place where hot water is applied, and the distribution of heat is so uniform, that all parts of the wall will be heated to the same extent, which is not the case where hot-air or smoke-flues are used.

FORCING VINES.

The temperature in the grape-house should be continued with regularity, as near to 75° as possible; and if success have attended the management, the fruit will be set by the beginning of the month, and be swelling fast towards the end of it. Larger quantities of water should now be regularly given to the vines at their roots, and occasionally liquid manure should be applied to them also, both to their roots within the house and to the border without, as far as the roots may reasonably be expected to have extended themselves. This sort of manure is highly beneficial to the vine which is termed a gross feeder, and from the weight of its fruit, the number and length of its branches, it seems to require, at first sight, a greater share of nourishment than any other plant which inhabits our forcing-houses. The great fertility of the celebrated Hampton-Court vine is said to be principally owing to the roots having extended themselves into a common-sewer, in the vicinity of the garden; and numerous similar accounts are given us of vines, celebrated for their great productiveness, deriving supplies of nourishment from less delicate sources.

However, a great weight and quantity of grapes are not always to be preferred, particularly when the means used to acquire that weight and quantity are prejudicial to the flavor of the fruit. Grapes, less luxuriantly fed, are generally acknowledged much higher flavored, and possessing a great degree of saccharine matter, of which larger and more showy berries and bunches are deficient.

However, in the earlier stages of their growth, liquid manure may be applied to their roots ; but it should be discontinued when the berries are about one-third of their size. Clear water should be supplied to them until they have nearly attained their full size, gradually withdrawing it as they begin to color ; from which time none should be given at their roots, unless the borders are very dry indeed, and even then with a sparing hand ; the syringing of the leaves should also be abandoned, as it is sure to destroy the fine rich bloom upon the berries.

But at this period of their growth, now under consideration, water from the engine should be applied abundantly over their leaves, to suppress or destroy the red spider ; which, without this precaution, would be highly detrimental to the foliage. Water, thus applied, should be sent out with considerable force, first from the right-hand end of the house, and then from the left, so that both sides of the leaves may be thoroughly scourged with the water once every day, and in warm days once in the morning, and again in the evening. The house should be regularly steamed every evening, according to directions previously given. The green fly seldom attacks the vine as it does the peach, but the thrips are often found curled up in the leaves ; which, on account of their perforating them in thousands of holes, soon destroy them, and cause them to assume a shrivelled and dead appearance. When these enemies make their appearance, the fumigations of tobacco must be had recourse to.

The utter destruction of both the red spider and thrips should be completed before the fruit attains its full size, and particularly before it begins to color, as the agents employed for their destruction, tobacco, fumigation, and water, cannot be then applied without injury to the fruit.

The directions noticed last month regarding pruning and training in the young wood, must be duly attended to throughout this month, in order to prevent any unnecessary waste of the strength of the vines by producing shoots, only to be taken off either soon or at the winter pruning, as well as to prevent confusion and too much shade, into which the vine, from its habits of rapid growth, is subject to run.

Those shoots which are even intended to be left at some length at the winter pruning, should be stopped after they have exceeded the required length that they are ultimately to be; that is to say, one-third, or rather more, should be stopped back a few joints, so as not to run up and crowd the other parts of the house. All lateral shoots, and such as issue from the old wood, together with all tendrils, should be removed as useless, and only robbing the vine, as well as causing confusion; leaving only the tendril next the extremity of those shoots which are laid in at the greatest length. Any leaves broken or injured by accident, or destroyed by insects, should be also removed, but none of the healthy leaves should be ever taken off, as the vine thereby becomes so much weakened, and when this practice is carried too far, the ill effects often appear in the shrivelling of the fruit before it attains maturity: this is most obvious in the tender kinds of vines, such as the Frontignac, and some others; while the hardier kinds, such as the Hamburg, &c., are less effected by it. Air should be admitted freely every day by opening the ventilators or sashes more or less, according to circumstances.

It is wisely observed by Nicol, that a man to be a good trainer of vines, and to be able to provide for a crop the following season, must have some forethought, and be capable of making his selections as the plants shoot, even at this distance of time. It must be pre-determined how he shall prune, and where he shall cut at the end of the season, and so, as it were, fashion the plants to his mind. He has this more effectually in his power, with respect to the vine, than any other fruit-tree, on account of its rapidity of growth and docility.

Such shoots as may have been stopped, as directed above, will be apt to push again. Allow the lateral that pushes to run a few joints, and then shorten it back to one, and so on, as it pushes, until it stop entirely. When the proper shoot from which these issued becomes ripened nearly to the extremity, the whole of the said laterals may be cut off at the originally shortened part, or at one joint above it, if there be reason to fear that the uppermost bud of the proper shoot will start.

FORCING CUCUMBERS AND MELONS.

Cucumbers and melons should now be kept in a growing state, and plentifully supplied with heat, air, and water. Examine the heat in the beds frequently, and as it begins to decline, let it be renewed by the application of fresh linings, or by renewing such linings as may have been already applied. Air should be freely admitted every day, in a greater or less degree, accordingly as the weather is favorable or unfavorable, by tilting up the sashes, or by drawing them up or down a few inches, giving and reducing it by degrees, as the state of the weather may direct; taking care to shut them up in the afternoon before they become too cool, and that they may regain a few degrees of heat to keep them sufficiently warm during the night. The mercury should not be allowed to rise in the thermometer during sunshine above 70° or 72° , but air should be admitted to keep it at or near those points; and by shutting up at an early period in the afternoon, this temperature will be kept up for a considerable length of time. Water should be applied liberally from the rose of the water-pot every two or three days, generally watering in the afternoon about three or four o'clock, but in dull cloudy weather it may be applied earlier; care, however, must be taken that it is not applied when the sun is powerful, as the leaves would be scorched by his rays acting upon the particles of water upon them. It will still be necessary to have the chill taken off the water before it is applied to them.

At this season, cucumber-plants are sometimes infested with the green fly, and also with that much more troublesome enemy the thrips; if either of these make their appearance, recourse must be had to fumigation, which will soon rid them of both these troublesome enemies. From the mode of cultivation, the red spider seldom invades them, as it is only in dry warm atmospheres that that insect exists, and which are extremely unfavorable to the growth of the cucumber. A mild humid heat is that in which they are found to prosper best, and in such the red spider seldom makes its appearance. As the plants extend their shoots, the mould should also be extended, and should now be made good all over the beds; the vines

should be closely, neatly, and regularly pegged down to it. They should also be moderately thinned, if they be too thick and crowded, with the view to prevent confusion, as well as to avoid weakening the plants with a superfluity of useless shoots and leaves. This thinning or pruning should, however, be cautiously done, a little only at a time being removed, and as they are apt to bleed, they would be much weakened if too much be cut at once. All bruised, damped, or decayed leaves, should be carefully removed as they appear, and no weeds suffered to grow in the beds; if this be not attended to, damp will naturally be engendered, and will at all times be very injurious to the plants.

It not unfrequently happens, that the leaves of the plants will flag or droop, particularly if hot sunny weather succeed dull cloudy days; and when such occur, let recourse be had to a slight shading, either by throwing a thin mat, or sprinkling a little dry hay, straw, or litter over the glass, but this shading should be removed as soon as the sun becomes less powerful.

Towards the middle or end of the month, if the weather be mild, ridges should be put up, upon which to plant out both cucumbers and melons, to be perfected by the protection of large bell or hand-glasses; however, unless in favorable situations, melons will not succeed so well without the protection of frames and lights, in addition to dung-beds. Cucumbers will be found to succeed in most situations in this manner, if protected till the end of the month; after which time, they will succeed well without any covering, except, for greater security, a few mats may be thrown over them every evening till towards the end of May, when they may be dispensed with. In forming these ridges, they should not be sunk under the surface, as is most frequently done; for, by being sunk, it will be impossible to refresh the heat, should it be required, by the application of linings. If it be intended to have many grown in this manner, it is advisable to put up the ridges or beds parallel to each other, from three to four feet apart, and the ridges may be of the width of three feet each. When the heat begins to decline in the ridges, the space between them may be filled

up with dung or leaves, sweepings of lawns, or any vegetable substance capable of affording heat by means of fermentation. This will not only add to the heat of the ridges, but will also increase their surface for the plants to be trained upon. If the directions formerly given have been attended to, as far as regards sowing successional crops of seed of these plants in pans or pots placed in the beds in a more advanced state of growth, there will be by this time an abundance of young plants, fit for planting out upon these ridges. As soon as the ridges are put up, about the height of two feet and a half and three feet broad, and the heat sufficiently up, let their whole surface be covered with mould, such as is used for cucumbers in the pits or frames; and for melons, mould should be used of a stronger quality, as has been already noticed. This covering of mould should not be less than ten inches thick over the whole ridge, and where the plants are to be placed it may be fifteen, laying the whole in a sloping manner, both to throw off superfluous water, and to expose the plants to a better angle to the horizon; the mould afterwards to be increased in depth as the roots of the plants extend themselves.

In planting out the plants, let three be placed in each hole, as has been directed for ridging out in the hot-bed frames, and each patch of plants or holes, as they are termed, be placed at the distance of three feet and a half apart, exactly in the middle of each ridge. When the plants are put in, give a gentle watering (the chill being previously taken off) to settle the mould round their roots. Place over each patch, or hole, a large bell-glass, or hand-glass, which may be shut down close for the first day or two after planting, to encourage the formation of fresh roots. If the weather be clear, and much sunshine, let each glass be shaded until the plants have taken root in the fresh mould: this shading to be only used during sunshine, and removed when all danger of its power is over. They will require to be covered with mats every evening till towards the end of the month, or probably till the middle of the succeeding one, so as to guard sufficiently against cold, damp, or frosty weather; for if they be checked with cold at their first setting off, gum, canker, and

many other diseases will follow, which may not be easily extirpated; no family of plants being so impatient of checks of this kind as those of the melon and cucumber tribe.

Their general management on ridges varies not from that of the same plants in hot-bed, with this difference only, they will require to be more sparingly supplied with water, particularly until they be fully established and the season sufficiently mild; after which they will require, in dry weather, more copious supplies of that element than such as are in close boxes, being more exposed to the drying effects of wind and sunshine, and growing in an airy open atmosphere, they will be able to digest a greater portion of that necessary element.

If the plants have not been previously stopped or topped, it must not be omitted at their planting out. This operation should be performed when the plants have two or three leaves, in the manner already directed. Each plant thus stopped will send out two, three, four, or more runners; and these runners, if no fruit appear upon them, (but this is not often the case,) should be stopped in the same manner when they have extended to three joints. This stopping of the shoots should be constantly performed until fruit appear; afterwards they may be allowed to extend to a considerable length, and if not checked by bad management, will continue to send out lateral shoots naturally, which shoots will produce an abundance of fruit.

When the plants have been planted out two or three days, air should be admitted gradually; beginning by merely placing a piece of chip or slate under the edge of the glass, and afterwards increased to the full thickness of a brick upon its edge. When the vines or shoots extend themselves beyond the boundaries of the glass, they should be permitted further to extend themselves freely, by placing a brick under each corner of the glass, so that the shoots may have free egress under them; but the glasses should not be entirely removed from over the roots until the end of June or July.

The general management of melons differs little from that of the cucumber, with this distinction only, that, to have them in perfection, they require a higher temperature throughout their whole growth, for the strictest attention should be paid

to the state of the heat in the beds, and upon the first appearance of any decline in the heat, the linings should be renewed, or made entirely fresh. Accordingly as the shoots extend themselves, they should be stopped, as already directed for cucumbers, and carefully trained down to the surface of the beds; a certain portion of mould should be added as the roots begin to make their appearance through the hills, and as it is progressively applied, it should be well trodden or beaten in a compact body. Care must be taken that no damp nor mouldiness appears in the beds; and to guard against this evil, the surface should be kept clear of weeds, and stirred frequently up to the depth of half an inch, and all decayed or dead leaves carefully removed. Melons suffer much more from the loss of leaves and hard pruning than cucumbers; and when it is necessary to remove either, let the end of the shoot or foot-stalk of the amputated leaves be squeezed between the finger and thumb, so as to bruise the ends of the vessels and prevent a too copious bleeding.

The vines, or runners, should be carefully pegged down close to the surface, by which they will not be liable to be displaced, nor will they rub against each other, which might be productive of wounds, which, if not attended to, would produce canker; and this happening to a principal branch, would endanger its total loss. This circumstance happens not unfrequently, when the vines have almost filled their allotted space, and their share of fruit set and fast swelling.

When a canker of this kind occurs, from damp or wounds, a little unslaked lime or chalk, finely pounded, and laid over the wound, will tend to dry up the damp; but if canker arise, from want of sufficient heat, which is not unfrequently the case, the crop stands in great danger of being spoiled; and should the fruit, by a renewal of the heat, be brought forward, it will neither be handsome nor well-flavored.

Mr. Knight, in the *Hort. Trans.*, sensible of the injury which melon-plants sustain by losing their leaves, recommends that the utmost care be paid to their preservation, and insinuates that their leaves should never be displaced from their natural position, even by the process of watering with a coarse rose watering-pot; but he recommends that the water be ap-

plied by a watering-pot without a rose, and carefully placed between the leaves, so that the mould and roots may be supplied without injury to the leaves. The same intelligent horticulturist also recommends growing melons in large pots, either placed in pits, frames, or forcing-houses, and training the vines or shoots to trellises. We, however, can perceive little benefit to be derived from growing them in pots, either in pits or frames, seeing that they succeed so much better when they are planted out in them; but where convenience admits of it, they may be successfully cultivated in large pots, similar to cucumbers, in forcing-houses of sufficient temperature. The idea of training them to trellises is good, and may be practised in either pits or frames with advantage, or, which will answer the same end, and be more readily applied, they may be trained to laths, placed at a little distance from the surface of the mould, and additional laths applied as the plants extend themselves; or trellises may be formed in convenient pieces, to be used in a similar manner. Some gardeners practice covering the surface of the beds with slates, tiles, sand, gravel, &c., and some cover it with moss: neither of these modes is advisable, as the reflection of the rays of heat from such bodies will render the plants in danger of being first infested by the red spider, and finally destroyed either by them or the too powerful effects of the rays of the sun. "By mossing the surface," Nicol justly observes, "the indolent may find a pretext, as it no doubt in some measure lessens the labour of watering; but it is wrong to pursue that method, in so far as it harbours and encourages the breeding of various insects; and as the fruit approaches to maturity, taints it with an unpleasant effluviaum."

Air and water must be supplied as the weather and state of the plants may determine, and the operation of impregnation should not by any means be neglected. In the application of water, it should not be done in a careless manner as a matter of course, but it should be given in a less or greater quantity as may be required, preferring to give a little and often, rather than to give a large supply at once. Accordingly as the blossoms are impregnated, and the rudiments of the young fruit appear, lay small pieces of tile or slate under each, which will prevent their liability to damp off.

Air should be less freely admitted to melons than to cucumbers, as the former require a higher temperature; however, in sunshine, the thermometer should not be allowed to rise above 75° or 80°, which is a temperature sufficiently high for their production.

In Persia, where they possess very superior sorts of melons, and where they have been cultivated from the earliest ages, great attention has been paid to their culture, growing them in fields, which are rendered capable of being frequently irrigated, and using for their principal manure large portions of pigeons' dung; indeed, so much importance do they attach to this manure, that the melon-growers keep dove-cots on purpose to procure it in abundance, and even purchase it at an extravagant price. This mode of supplying melons with additional nourishment, has of late years been recommended by many, and practised by several eminent horticulturists. Some add the pigeons' dung in their compost, while others use it diluted in water, and apply it in its liquid state, taking care that none of it falls upon the leaves. We have for several years practised both modes, but never found that the melons were of better flavor, nor more abundant in crop, than when grown in fresh virgin-loam taken from a sheep-walk, and used without any previous preparation whatsoever. Melons may probably be grown to a larger size by the application of such powerful manures; but large melons, like most other fruits of magnitude, are seldom of good flavor.

Few fruits, the pine excepted, possess higher flavor than melons, if of good sorts and well cultivated, but the larger sorts of them are seldom fit to eat; hence the disrepute into which this excellent fruit has fallen.

Those who compete for the prizes awarded for the highest-flavored melons, are very particular in this matter. They most generally grow very small sorts, principally of the scarlet-flesh rock sorts, although sometimes green-fleshed ones succeed. They seldom use any manure whatever, and are always very sparing of water; never giving more after the fruit attains its full size than what is merely sufficient to keep the plants alive, and admitting plenty of air while the fruit is ripening.

M A Y.

NURSING PINE-PLANTS.

Towards the middle of this month, the beds will have sunk considerably, and will also have declined in heat; it will therefore be necessary that the plants be all taken out, observing to tie them up as recommended in March, for the greater preservation of their leaves; which, when injured, by being broken or bruised, soon assume a sickly appearance, and cease to be useful organs of the plant. The weather may now be expected to be fine; at least, a clear day or two should be chosen for this arrangement of the young pine-plants, in order that the operation may be effected with greater safety. After they are all removed from the bed, it should be well worked over to the very bottom, and all decayed matter thrown out. Where either bark or leaves are scarce, it would amply repay the trouble to pass all those which appear exhausted through a coarse riddle, returning the rougher particles into the pit, and removing the finer or more decayed parts to the compost-yard; which, if the beds have been composed entirely of leaves, will be found an extremely useful article in the compositions which are necessary not only for the growth of pines, but also for almost every plant in the garden; and those which may not be required for entering into the composts will be a useful manure to almost any soil. Should the beds be composed of tan, or tan and leaves mixed, the composition should also be saved, as it will become useful for many purposes, both in the formation of certain composts, as well as in the covering of many roots from the severity of the frosts, and several other purposes where light mould may be required.

The necessary quantity of fresh tan or leaves should be brought in, and carefully mixed with the half-decomposed that remains in the pits; observing to keep the greater proportion of fresh matter nearest the bottom, and keeping as much of

the more decayed upon the top, in which to plunge the pots upon their being again brought into the house.

The plants will now require to be carefully examined; and such as appear in want of shifting into larger pots, should be set out, and the necessary mould and pots got ready for that purpose. In preparing the plants for potting, after their being turned out of the pots, remove all small suckers that may be forming at their roots, and also displace such small and useless leaves as are nearest to the roots, as this will induce them to push out fresh and vigorous roots from the lower part of their stem. The pots being well drained, as already directed, the plants should be placed in them, observing previously to putting them in, to examine their roots, and cut out all those which are decayed or useless, and single out those which appear matted round the outside of the ball, or at the bottom of the pot. Those which have penetrated through the holes in the bottom, and have extended themselves in the tan, should be cut off, as they must have been injured in taking out the plants; independently of which, the shortening of their roots, that are of immoderate length, will induce the plants to push out a number of others nearer to the stem. The balls should not be much broken, unless they appear hard, or the mould be exhausted; in such cases, they may be carefully pushed in pieces, and the exhausted mould removed. In repotting them, let the mould be well shaken in amongst the roots, which should be rather dry than otherwise, and finely broken with the back of the spade, or with the hands, but not sifted, unless through a very coarse riddle; for when the mould is rendered too fine by sifting, it prevents the free escape of superfluous moisture, and becomes of too close a texture for the roots to push freely in; besides, in sifting the mould too fine, all the fibrous matter that it did contain would be rejected, and consequently the best part of the compost would be lost to the plants. Let the mould be well shaken in amongst the roots, and the plant gently shaken up and down, so that no vacancy may be left amongst the roots. Those which are repotted with their balls entire, should only have a few of their outer roots loosened, and be placed carefully in a larger pot, shaking in the mould regularly all round, so as to fill up the

whole space between the ball and the sides of the pot; but, even in this case, no other means of forcing down the mould should be used except the fingers, and well shaking the pot. We do not advise the use of a stick, as is often practised, as it is very liable to injure the roots, and if used very freely, renders the mould too compact. The sizes of the pots, as has been already noticed, must depend upon the magnitude and growth of the plants; each plant should be placed in a pot of such size as is suited to its strength. Fast-growing, luxuriant plants require larger pots, while weak or sickly ones will require pots only of the same size, or nearly so, to that from which they were taken: and those which are ill-rooted and sickly, will even require smaller pots than those from which they were taken. It is much better to shift often than to over-pot at once.

In filling the pots with mould, leave it at least an inch below the level of the margin of the pots, to allow room for holding water, and when the plants are all potted, give them a gentle watering, merely to settle the mould about their roots; but do not at this time give too much water, otherwise they would be not only chilled too much while out of their usual bottom-heat, but be also liable to be shaken out of the pots. A more copious watering will be necessary when they are replaced in the beds.

Any decayed or bruised leaves should be carefully cut away, and all dead pieces at the extremity of the leaves cut off; in performing which, use a very sharp knife, hold the leaf to be so pruned by the point, and draw the knife upwards, beginning below where the leaf is decayed, and cutting upwards in a slanting direction of some length.

Replunge the plants in the same manner as formerly directed, placing them in regular order as to their heights, always keeping the smallest and those which are unpotted in front. Such as have been rooting in the bed out of pots, should now be put into pots, differing in size according to their strength, and take their place among the other potted plants. As the plunging goes on, care must be taken not to allow the tan or leaves to cover the mould in the pots too much; for, if such be the case, it will be difficult to ascertain when they may be

in want of water, or when watered too much. The tan, or leaves should be firmly packed round the pots, to keep them steady; for if this point be not attended to, the sinking and contraction of the bed would be apt to throw them into an unlevel position, by which means, the water which is given them would not be contained in the pots sufficiently long to admit of its penetrating to their roots, and the plants would also have a very unsightly appearance. They will now require more room between each other in the bed, to allow a free circulation of air and sunshine to penetrate amongst them. As the season will now be becoming milder, a frame or two may be erected in the melon-ground, in which to place all the smallest, and particularly such as are not yet potted; this will admit of plenty of room being given to the more forward plants in the nursing-pits. The operation of plunging being finished, let the whole have a good watering at their roots, and the strings of matting with which they have been tied up removed; the whole should then be well washed over-head with the syringe, to clear them of dust, and also to refresh the foliage. Place watch-sticks in the bed, at regular distances, by which the heat may be ascertained. If the season be mild, and a brisk heat come up in the bed, fires may be dispensed with, at least very much diminished, or only lighted on very cold nights, and gradually given over as the state of the weather and heat of the bed may determine. The temperature should, however, be kept up to 70°, mornings and evenings by aid of the flues, if the heat of the bed be not sufficient. Accordingly as the heat of the bed and the effects of sunshine raise the temperature, water should be more freely administered; occasionally watering with the liquid manure. Air should also be freely admitted every favorable opportunity, giving and reducing it by degrees, as the state of the weather may or may not be favorable.

SUCCESSION PINE-PLANTS.

The directions already given for the nursing-pit, are applicable also to the succession-pit. The same operations of renewing the beds, and shifting such plants as may be in want

of it, should also be performed in this compartment. The temperature, however, should be kept as steadily as possible to 65° or 70° ; if after the bed be in a good state of fermentation, and the thermometer keep above 65° , fire-heat may be discontinued; but if any cold weather follow, and the temperature fall below that point, occasional fires should be used. After the fires are left off, and the flues no longer hot enough to produce steam as usual, the plants should be syringed in the evenings or mornings in fine weather, and the house shut closely up. The heat of the bed will be sufficient to produce a slight steam; or, if this be not found sufficient, the flues may be heated for the purpose of producing steam in the usual way, and afterwards the fire let out.

FRUITING PINE-PLANTS.

If the heat in the bark-bed in this compartment has considerably decreased, it may be necessary about the beginning of the month to have it renewed; but if this can be avoided, it would be more advisable, as the plants now will be more or less injured by being removed, according to the state of forwardness of the fruit. Unless the heat has fallen to too low a temperature at the roots of the plants, it would be advisable rather to refresh the heat in the bark-bed, by surfacing it over with fresh tan or leaves, that may have undergone a sufficient degree of fermentation for the purpose. This stratum of tan or leaves, may be laid on to the thickness of a foot or more, as the bed will by this time have considerably sunk; and the pots having been increased in depth by the addition of the circle of turf and mould, formerly directed to be applied, will thus stand some inches above the surface of the bed. This addition to the bed must be carefully applied, so as not to injure the plants, and will, by confining the remaining heat in the bed beneath, together with its own fermentation, produce a considerable temperature, and may be sufficient, with the addition of a little fire-heat in cloudy weather, to bring the principal part of the plants to maturity. The roots having by this time considerably extended themselves in the bed, it would be a serious check to them to be taken up, in order to

get the whole bed renewed. However, if the temperature of the bed be fallen too low, their removal will become necessary, as a want of sufficient bottom-heat at this time would be attended with serious consequences to the fruit. In performing this, therefore, the greatest possible care should be taken to remove them, so as not to injure the roots but as little as possible. The bed will not probably require to be turned over at this time quite to the bottom, therefore, in turning it over, the fresh tan or leaves used, should be kept well down, still bearing in mind to keep a sufficient quantity of half-decayed matter upon the surface, in which to plunge the pots. Such plants, the fruit of which is nearly swelled, should, as they are removed out of the bed, be supported with neat sticks, to prevent them being broken off, or the fruit-stalk damaged with their weight. During the time the plants are out, trim all decayed leaves off, and shorten such as are decayed at their points, they being of no use, and will make the plants look better when removed. Such plants, the fruit of which is fully swelled, or beginning to ripen, should not be disturbed at their surface; but all such as are less forward, should have all the mould removed from their surface that is unoccupied with roots, and either replaced now, or as soon as they are replunged in the bed.

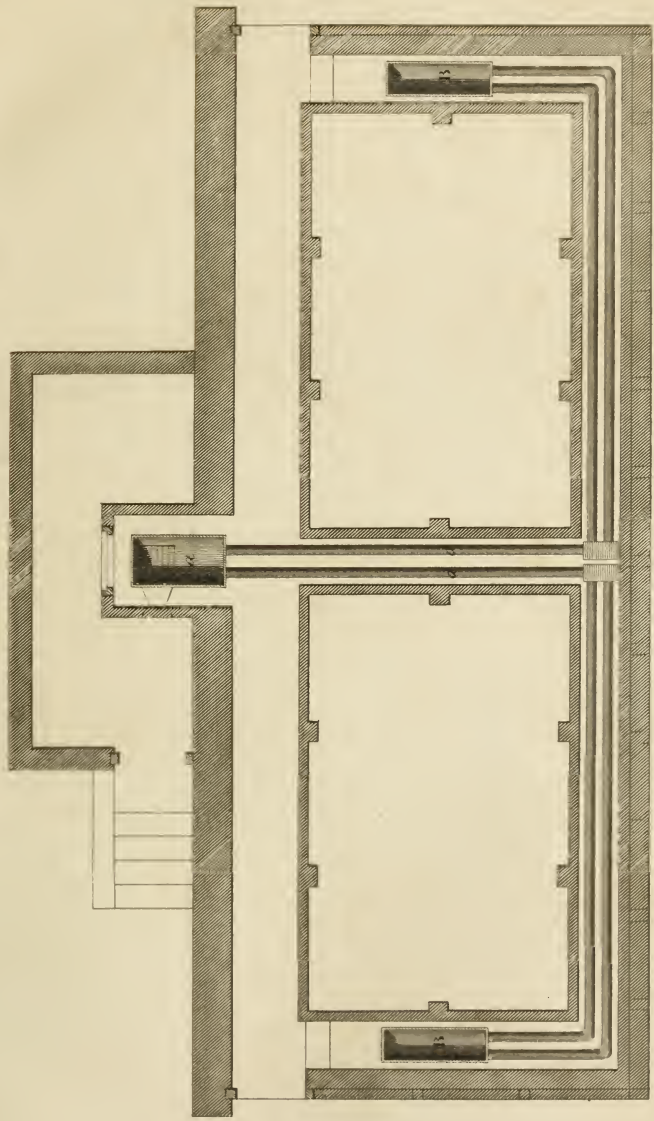
If any of the plants appear sickly, and the fruit not more than half swelled, they may be shifted with safety, and either placed in the same sized pots, or, if their roots be few and diseased, which will generally be the case with such as show less vigour than the others, their treatment being the same, they may be placed in smaller pots, their balls being reduced, and their roots singled out, and all decayed ones removed; and if carefully repotted, and attended to with water as their state may require, they will perfect their fruit much better than if they had been left in the pots in which they formerly grew. It will, however, be a check to the growth of the fruit, and retard its ripening for some weeks. The plants being examined, and the bed ready for their reception, they should be plunged as directed in February; keeping such as are nearly ripe at one end, to be removed when cut, without deranging the whole, and their place of course filled up with



Raised by F. W. Wood, Esq.
in the collection of Mr. Feilding
at London.

Co. M. R. M. S. C.

Plan





plants from the succession-house. When they are all plunged, the bed and house cleaned and regulated, give them a watering at their roots, and a profuse washing over-head with the syringe, to refresh them and clean them of the dust or filth contracted while undergoing the necessary removal. The plants showing fruit, in blossom, and swelling their fruit, should be liberally supplied with water every third or fourth day; but those which have nearly attained their full growth, and particularly such as are coloring to ripen, should have less and less water given them as they approach maturity, reducing it by degrees, until it be entirely withheld some time before ripening. If this be not attended to, the flavor of the fruit will be very much deteriorated, and lose much of that richness, which the pine is well known to possess when properly cultivated, and which has gained it the appellation of the *king of fruits*.

We may also remark, that if pines be not cut soon after they begin to color, "that is, just when the fruit is of a greenish yellow, or straw color, they fall off greatly in flavor and richness, and that sharp, luscious taste, so much admired, becomes insipid." It is often necessary to retard pines, when ripe, for some days, often a week or more after they are ripe, to answer some particular demand; and when this is the case, they should not be cut from the plant, but removed carefully in the pots to the fruit-room, or some other airy cool place, where they will remain, without much injury, for a week or more, and will not shrivel nor lose their flavor so much as when they are separated from the plant. In cutting the pine for use, if not immediately to be sent to table on the same day, a considerable piece of the fruit-stem should be left attached to it, and never, until within a few hours of the time that it is to be eaten, should those scale-like appendages upon the pips be cut off, for, in doing this, the skin might be wounded, and if kept for any time after their removal, decay would commence. Some prefer to have the pine sent to table with a portion of the fruit-stalk attached to it, and those scale-like appendages left upon it; while others have the stem cut close off, level with the base of the fruit, so that it may stand upon its own base, in an upright position. In no case, however, is the crown removed until the fruit be cut to be eaten.

Unless the weather be unusually fine, the fires must be continued till the end of this month, and probably longer. The temperature by fire-heat should be kept up to 75° as a minimum, and 80° as a maximum; however, the temperature throughout the day may be allowed to range from that to 100° , without any injury to the plants. Air must be freely admitted upon all occasions, and regulated by opening and shutting up the house, as the state of the weather may require. As the fruit approaches maturity, this is absolutely necessary to enhance its flavor.

FORCING PEACHES.

The temperature in this department should be gradually raised to 60° as the fruit advances, and the stoning of the fruit has been accomplished. After that time, all danger is over, provided the trees be in a healthy state; and the final thinning of the fruit may then be proceeded with. It should, however, be a maxim, that, however much the fruit may be thinned, it is safest to leave a few to be occasionally picked off as they advance to greater maturity.

Where fine fruit is an object, they should be thinned, upon healthy trees, to the distance of nine or ten inches apart, or even twelve; but where the trees are rather weak, not above half that number of fruit, or even less, should be left. No leaves should be picked off them at this time, as the fruit will swell much better when partially shaded with them; neither should two fruits remain upon a shoot that is not considered sufficiently strong to bring them to perfection.

Water may now be given in much more abundant supplies than hitherto, at least since the opening of the blossoms, both at the roots and over the leaves. This latter should be regularly applied every morning and evening, observing to have the morning syringing done before the sun acts too powerfully upon the house; the evening watering should be done the last thing at night, so that the water may remain the longer upon the trees. It should be applied with considerable force upon the trees, so as to annoy any insects that may attempt a settlement, as well as a substitute for wind to set the foliage in motion, which is

of much importance to them, as they are precluded from that natural agent.

The pruning and training-in of the young shoots should be continued, as directed last month, and all water-shoots and laterals removed, unless where some of the latter may be required to fill up any vacancies in the tree. Towards the end of this month, if the weather be fine, fire-heat may probably be dispensed with, but this must be determined by the range of the thermometer; neither should the **fire-heat** be withdrawn from them suddenly, nor all at once. Circumstances may require a slight fire in the evenings, merely to put a little heat into the house, in addition to that which it has imbibed from the sun; and even in the mornings, if dull and cloudy weather should happen, it may not be unnecessary; for, if the fruit experience a check at this stage of their growth, it will materially affect their swelling to a full size. If the borders have been mulched, or covered with dung, it should now be removed, and the application of liquid manure discontinued. The flavor of the peach is so delicate, that any food of so gross a nature would affect it. The fumigations of tobacco should be continued upon the least appearance of fly; for, if not thoroughly eradicated now, it will not be so easily effected after the fruit begins to swell off for ripening, as the flavor would be affected by the narcotic vapour.

FORCING VINES.

The temperature of the vinery should be continued at the same point recommended last month, with as much regularity as possible during the night; however, as the weather becomes warmer, the temperature may be allowed to rise a few degrees during the heat of the day, and graduated by ventilation to the proper temperature. As the fruit will now be swelling, and approaching that state when the thinning of the bunches becomes necessary, in order that the berries may have sufficient room to swell to their full size, this very necessary operation should not be neglected, as well as the tying up of the shoulders of such bunches as require it, for the same purpose.

With this view, go over every bunch in the house, and with fresh matting, or small string, fix one end of it to the extreme part or point of the shoulder of the bunch, and raise it up as high as it will admit of, without running the hazard of its being broken off, and fix the other end carefully to the wires or shoots of the vines; then, with a pair of finely-pointed scissars, rather longer than those in general use, for the convenience of getting at the berries towards the centre of the bunch, begin to cut out all the smallest first, or such as are immaturity formed, and also such a quantity of the more perfect ones, leaving the remaining berries hanging quite loose, and detached from each other. As in the case of thinning other fruits, this operation should not be completed at one time, but reserving the final thinning till the beginning of next month. It is no easy matter to say how many berries should be cut out, as that must always depend on the kinds of vines, the number of bunches upon them, and the size that the berries attain when fully matured. Those which set their fruit closely, or crowded, should be more thinned than others that set less freely; and such as have many bunches of moderate size upon them, should be much more thinned than when the crop is scanty, and, in many cases, the removal of many entire bunches will be necessary; where such is the case, the smallest will of course be cut off, and the finest left on the vine. Those which produce berries of a large size, will also require to be well thinned, and where fine fruit is the object, all must be well thinned, that they may attain greater perfection; and to say that one-fourth or one-third of the berries should be cut off, will not, in most cases, be too much. The muscadine, tokay, and sweet-water, will not require so much thinning, generally, as some of the others. These are apt to have many small imperfect berries amongst the bunches, which should all be cut out, and only a few of the perfect ones. Such compact growing sorts as the frontigniacs, should be more fully thinned, to allow room for the remaining berries to swell to their full size, as well as to prevent the chance of their rotting, in damp and cloudy weather, after they are ripe, which a free circulation of air among their berries will materially prevent.

The grapes cut off in thinning the bunches, make excellent tarts, and are used for other domestic purposes; they should, therefore, be carefully saved. If, while the operation of thinning goes on, a mat or piece of light canvas be suspended under the bunches, the berries will drop into it, and be less bruised, and more readily collected, than if permitted to fall on the floor of the house.

Water should now be abundantly applied to the plants both at their roots and also over their leaves, by means of the syringe; the use of liquid manure should now be entirely discontinued, to prevent the fruit from acquiring any disagreeable flavor; but the use of clear water will materially forward the swelling of the fruit, and give strength to the vines.

FORCING CUCUMBERS AND MELONS.

A moderate degree of heat will still be necessary to be kept up in the cucumber-beds, and air and water more liberally supplied than has hitherto been done. The crops of early cucumbers will now be bearing in abundance, and will require little further attention than the admission of air and a plentiful supply of water. When the vines or shoots become confused or crowded, let them be moderately thinned, so as to admit a circulation of air into every part of the bed; this thinning should be performed by degrees, and not at one specific time; for which purpose, look over the beds once or twice a week during the season. When the plants appear affected by the too powerful influence of the sun, let them be shaded during a few hours each day, as directed last month, either by spreading a thin mat over them, or a little hay, straw, or dry litter; which, however, should not be put on too thick, nor yet allowed to remain on too long in the afternoon.

Ridges may now be put up, on which to plant out cucumbers, to produce their fruit under hand or bell-glasses, if not done last month; but it may be necessary, for the greater supply, to put some out on ridges both at that and the present time also. For directions on this head, see *last month*.

The melons which were sown in January and February, will now be in perfection, or nearly approaching to it. As these fruits approach maturity, let a smaller quantity of water be given, and air freely admitted; for, without these points be attended to, the flavor of the fruit will be indifferent. They will now require no more water, but merely sufficient to keep the plants in life, until they ripen off their fruit. The vines may now be thinned out considerably, but not until the whole of the fruit be just on the eve of ripening; for if done sooner, it would give too sudden a check to the plants, and cause many, probably the whole of the fruit, to ripen prematurely, and become shrivelled and insipid. This thinning of the vines is only intended to admit of a free circulation of air, and to allow the sun to penetrate to the fruit without being shaded by the foliage.

A watchful eye should now be kept upon the fruit, so that it may not be permitted to remain upon the plant longer than it is ripe, for if this be allowed, the fruit will lose much of its flavor. It is only by observation that the gardener can become acquainted with the proper time to gather the fruits of his labour, and this observation is strikingly applicable to melons: no specific time can be fixed on, with any certainty, when to cut this fruit, ripening, as it does sometimes, in the interval of a few hours. Those which, to all appearance in the morning, would have required a day or two to ripen, may, towards the afternoon of the same day, be in a fit state to send to the table. Some sorts change color previously to becoming ripe, whilst others retain their original color after they are ripe. A disposition is generally to be observed of their breaking away from the foot-stalk of the fruit previously to their being ripe: this point should be attended to; and as soon as that part which joins the foot-stalk and the fruit becomes cracked all round, the fruit may be cut with safety. Some sorts indicate by their perfume that they are ripe, whilst others, and indeed some of the finest, have little or no smell until they be cut open. They should be sent to table as soon after they are cut as possible, as they lose much of their flavor by keeping. This is, however, not always prac-

licable; for when it is intended to keep them for a few days after they are ripe, they should be placed in a cool airy cellar, or fruit-room, and during the time that they are there, they should be placed upon clean sheets of white paper.

The saving of melon-seeds is an important part of the duty of the cultivator, as much future disappointment will occur, should the seeds of different sorts be mixed or substituted for each other. The individual who is particular in the flavor of his melons, will act judiciously, when he cuts a fruit to his mind, to save the seeds. It is from fruit of the earliest crops that seeds should be saved, as by that means there is less chance of the sort being impregnated by any other of less merit; as in the early part of the season, the operation of impregnation is necessary to be done by the cultivator, and that operation being performed from flowers in the same frame, and possibly from the same plant, there is less risk of the seeds becoming hebridized at that time than at a later period of the year, when bees and other insects are flying from flower to flower, and carrying the fertilizing dust of the male flower to the female. As the seeds are selected from one or more fruit, but which, for greater certainty, should be kept separate, they should be carefully washed in clean water, allowing those seeds which swim upon the surface of the water to float off, reserving such only as sink to the bottom. These, when sufficiently dry, should be packed up in papers, the seeds of each fruit put up separately, correctly labeled, their name, size, quality, when sown, when cut, and any other observation of interest written upon the packet, together with the year of their growth. Melon-seeds improve by age, and should not be sown, if it can be avoided, under two years old. They will retain their vegetating properties for twenty years or more. If seeds of the growth of last season be sown, they for the most part produce plants of very gross habits, and will not be so fruitful, but grow more to vines than fruit.

To obviate this disadvantage, when older seeds cannot be procured, the seeds may be worn in the pocket, near the body, for some weeks previously to sowing, which will have the effect of fully maturing them.

Some gardeners place much dependance upon the second and often upon a third crop from the same plants, but this is not to be depended upon. The finer kinds of melons will seldom produce more than one good crop of fruit; for to have the fruit in perfection, the vines are generally killed, or so much weakened by the sparing supply of water given them during the ripening off of the fruit, that they seldom break sufficiently strong to produce a second, much less a third crop.

Young plants may be brought forward in the secondary frames, and when too large to remain uninjured in the pots into which they were originally potted off, they may be transplanted into small baskets, in which they may remain until the crops be removed from under the frames hitherto occupied with the earliest crops; and when those are cut, the beds may be renewed, fresh mould put in, and the plants removed into them, still in the baskets, which may be partially cut away, or may remain, as the roots will find sufficient means of escaping into the fresh mould of the bed. A little gentle heat applied, and sufficient air and water administered, will forward these plants into fruit in due time. Such plants will produce better fruit, and with greater certainty, than by pruning in and regenerating the old plants from which the crop has been cut.

Some of the early canteloupe varieties will, however, produce second, and often third crops, by being sufficiently cut in after their first crop has been cut; but these, although extremely well suited, owing to their hardiness and free setting, for the most forward crops, are not to be put in comparison with many more preferable sorts; which, if treated as above, will produce their fruit in August and September, and although less in number or quantity, will be decidedly superior in flavor.

Those, however, who prefer to re-establish the old plants for future crops, should shorten in the vines or shoots to a good fresh-looking eye, and thin out all decayed or unhealthy shoots, dead leaves, &c. In cutting, attend to cut an inch or two above the joint from which the fresh shoots are expected to issue, and bruise the end of the shoots so cut between the

finger and thumb, which will in a great measure prevent their bleeding.

The plants so treated should be shaded from the mid-day's sun for a few days, exposing them by degrees. Let the mould in the frames be well watered and fresh surfaced with fresh mould. Previously to laying on this additional fresh mould, fork up the surface carefully with a bit of stick, but not so as to injure the roots. For some time after this operation, the frames should be kept shut up rather close, which will induce the plants to push out fresh roots; and as they appear to be rooting, and breaking into fresh shoots, let air be again admitted gradually until they be fully re-established. After this, give air, water, prune and train them, and otherwise manage them, as if they were young plants. After this second crop is cut, proceed in like manner to prepare for a third.

The successional crops of melons should be attended to, as directed above for the early crops; and if attention be paid to these hints, or improved upon, the success will be complete.

Ridges should now be put up for planting out melons, to produce their fruit under bell or hand-glasses. These ridges should be put up as already directed for cucumbers.—(See *last month*.) Or beds may be put up similar to those for the production of the earlier crops, and covered with frames and sashes fitted with oil-paper instead of glass. The plants for this purpose being raised from seeds sown in March, or the beginning of last month, will be now of a proper size for final transplantation into frames of the above description. The general management of melon-plants in such frames, is the same as of those under glass, as has been already described.

Plants now put out under such frames or upon ridges covered with hand-glass, will produce their fruit by the end of July, and in August and the beginning of September they will be in perfection. Beds are sometimes made up for the production of these fruits in the form of an inclined plane, presenting their sloping side to the sun; and such beds appear to have been the most primitive form, both for the production of cucumbers and melons, and are reported to have been in use, amongst the commercial and private gardeners, so early as Charles the Second's reign, and were covered with straw

as a protection from frost at night. Beds of a similar nature have been recommended by a writer in the *Hort. Trans.*, but it is only in very favorable situations that these fruits can be produced in any perfection upon such beds, without the assistance of glass.

The market-gardeners in the vicinity of London, produce great crops of melons upon ridges similar to those already described for cucumbers, making the ridges parallel to each other, and as their heat declines, they fill up the spaces between them with fresh dung, which adds fresh heat to the plants, while it completes the beds for the plants to run upon.

The distance at which the plants are placed from each other, that is, the patches, or holes of three plants each, is about four feet or four and a half feet. When the plants are planted, give a little water to settle the mould round their roots, and put on the glasses over them, which should remain close down for a day or two, if the bed be not very warm. As soon as the plants have struck root, the glasses may be elevated a little by degrees, so as to admit of a sufficient quantity of air for their support; this air to be gradually augmented until they be finally established, and then the glasses may be removed during fine days, but replaced every evening. It will be necessary to cover them also at nights with mats, for fear of frost, which not unfrequently happens during this month, and which, if the plants be not protected from it, would entirely destroy them. For a few days after the plants are put out, shade them from the full sun a few hours every day; and as they get established, let such shading be discontinued by degrees, thus accustoming them to the full power of the sun. When the plants have covered the space under the glasses, they should be allowed to escape out under them, but it will not be before the end of the month that they can be considered as safe from slight frosts. Those shoots which extend beyond the limits of the glasses, must be carefully protected from cold or injury, by covering not only at night, but also during the coldest part of some days, but this covering must be determined by the state of the temperature of the weather. As they extend beyond the limits of the glasses, their shoots are to be regulated and pegged down to the

surface of the bed, as already directed for melons under frames and glasses. As the weather becomes more mild, elevate the glasses upon bricks or other props, sufficiently high to admit of the runners spreading freely out on all sides. For the better protection of the plants, as they extend from under the glasses, it will be advisable to have in readiness a sufficient number of oil-paper frames wherewith to cover them, previously to removing the glasses altogether.—(See *next month*.)

Cucumbers, to pickle, are often sown in the natural ground where they are to remain, and in favorable situations are found to succeed perfectly, but for this purpose, it will be soon enough towards the end of this month to sow the seeds. Where the situation is favorable, and the demand great for such crops, a piece of ground is put in readiness for the reception of the seeds by being dug regularly over, and manured, of a size according to the quantity wanted; it is then divided into beds five or six feet broad, allowing a foot or eighteen inches for a footpath between each bed. The seeds are then sown in patches along the middle of each of the beds, each patch being about three feet and a half apart; in each patch ten or twelve seeds are dropped, and covered to the depth of an inch.

If the weather should prove dry and hot, give moderate supplies of water to each patch of seeds; but this must be rather sparingly administered, for, if too freely indulged in, great danger would be incurred of rotting the seeds altogether. When the seeds have germinated, and the young plants are coming up, water may then be more freely given to them.

When the plants have been up eight or ten days, they should be carefully thinned; for if each seed sown has germinated, the plants will be much too thick. This thinning should not be done at once, but at two or three several times, allowing a day or two to intervene between each thinning. If the weather be cloudy, or if warm showers have fallen, take advantage of such weather for this operation; but if no warm showers should fall, give a gentle watering both before thinning and likewise afterwards, which will prevent any of the plants which are intended to remain from sustaining injury. When finally thinned, they should stand in number

three or four only of the best and strongest plants in each patch.

This is the method adopted by the London gardeners, and those who supply the metropolis with this fruit; but, in the majority of situations, the most certain method of procuring them will be found to put up slight ridges or hot-beds for the reception of the plants, which beds need not be more than eighteen inches or a foot in height, according to the quality of the material of which they are composed, and of a length sufficient for the quantity intended to be grown. Their breadth need not be more than three feet, and placed in ranges parallel to each other, for the greater facility of covering them up and otherwise attending to them, as well as for the more readily filling up the spaces between them with fresh dung, sweepings of lawns, weeds, or other vegetable matter capable of affording an additional degree of heat, should the season turn out cold and backward. These beds or ridges should be entirely covered over with light rich mould, not sifted, but well broken with the spade, to the depth of ten or twelve inches. The beds being thus prepared, remove the plants into them, presuming that they have been previously reared in pans, and potted off in small pots, three or four plants in each, and forwarded either in some of the hot-beds occupied with melons or cucumbers, or, if wanted in a considerable quantity, upon a bed or beds purposely put up for them. They should be planted out, exactly as directed last month for cucumbers, upon ridges, and their general management attended to in a similar manner; covering them with hand or bell-glasses, or oil-paper frames, as a protection from the cold and wet; or they may be sown at once upon the beds or ridges, prepared as above for them, but the heat of the dung will, in this case, be considerably exhausted before the plants attain any considerable size. It is, therefore, much better to raise them previously, and transplant them when of a proper size, by which means they will be fully established before the first heat in the ridge or bed declines.

J U N E.

NURSERY AND SUCCESSION PINE-PLANTS.

During this month the young pine-plants will require liberal supplies of water and air, all of which will promote the growth of the plants. It may, however, be necessary to shift some of the plants into larger pots, that is, such as may have been marked out at the last shifting, and which were not then immediately in want of that assistance; as also to pot any of the crowns or suckers that may now be sufficiently rooted either in the front of the nursing-pit or in the frames, where the young plants of that description may have been placed, both to enjoy the advantage of light and room, and to afford the same advantage to such as are more forward in growth in the nursing or succession-pits. These frames should be kept up, by means of linings and renewing the beds occasionally, to the same temperature as recommended for the nursing-pit; and their general management must also be the same, only such of them as may have been planted out into decomposed leaves or rotten tan, will not require so much water, and it is essentially necessary to guard against too much rank steam, which would here produce a disposition in them to rot at the heart. Watch-sticks should be placed in the frames, and often examined, particularly after renewing the beds or applying fresh linings, as the roots, not being in pots, will be more liable to be injured by too much bottom heat. As the plants in these frames become sufficiently rooted, let them be potted in small pots, according to their size, and plunged again; they will then be in fit order in autumn to take their places in the nursing-pits, when such as are there at this time will have been removed to the succession ones.

FRUITING PINE-PLANTS.

The directions given last month for the general management of the fruiting plants, should be closely followed up during this month; observing to withdraw the quantity of water gradually from the plants as the fruit approaches towards perfection. Air must be freely admitted, and, if the weather be now fine, fires may be gradually discontinued, provided the temperature can be kept sufficiently high without them. As the fruit is cut for use, the plants may remain during the greater part of this month undisturbed, to forward the growth of the suckers: some of these will be sufficiently fit for being taken off the old plants before the rest; and such as are found to separate freely from the old plants, and have become of a brownish color at their bottom, may be taken carefully off, which will enable the plants to bring the remainder to greater perfection. Accordingly as these suckers are gathered off the plants, and the crowns returned after the fruit has been used, they should be laid by for some days to dry and harden at their bottoms. The crowns will generally require to lie longer drying than the suckers; a few days may be sufficient for the greater part of the latter, when they should be planted into the frames or in the front of the nursing-pit to root. After the crowns are fully dry, so as to be not likely to damp, a few of the lower and smaller leaves should be removed, and then planted along with the suckers to root, where they must remain till August, when they must be potted according to their respective sizes. Such plants as have had their fruit cut and their young suckers taken off, should be removed, and thrown away as fit for no other use. This will afford more space to those which remain, and make room for any that may have either been kept in the succession-pit for want of room in the fruiting-pit, or for such as may either have started prematurely, or been started for the purpose of fruiting late in autumn. Where there are any of these, they should be brought into the fruiting-house, accordingly as room is made by the removal of those which are taken away, and plunged here until a general regulation take place in the next

month, or beginning of August, as the state of the crop may determine. Such plants as are coming in for successional crops to ripen in autumn, and any that may have remained without showing fruit in the fruiting-pit, should be supplied with water, and otherwise managed, as has been already directed for such plants in the former months.

FORCING PEACHES.

The fruit will now be approaching fast to maturity, if the directions given in the preceding months have been fully acted upon, and other circumstances equally favorable have occurred. Air should be admitted now in large portions every day, and when the fruit is ripening, the sashes (if moveable) should be drawn down every fine dry day, that the fruit may enjoy as much as possible of the influence of the sun and air, to improve its flavor and color. It is a well-known fact, that peaches ripened in houses are never so fine-flavored, nor yet so well-colored, as those upon the open walls; therefore, the more they are now exposed to the free action of the sun and air, the finer will the fruit be. Care must be taken that, upon the approach of rain, the house be covered up, as wet would be highly injurious to them at this time. The waterings must now be discontinued; beginning first by withholding the bottom watering, and by degrees the use of the syringe, until the whole be left off. The leaves which shade the fruit, and which were directed last month to be left on, should now be displaced. If they cannot be pushed aside sufficiently to present the full exposure to the sun, let them be entirely taken off, leaving about an inch of the lower part of the leaf, together with the foot-stalk of the leaf, which may, in some cases, mature the bud at its base. To have high-colored and fine-flavored fruit is the ambition of every gardener; no means, therefore, are so likely to produce those effects as the removal of the sashes from the roof of the house at this period; but, as it has been already observed, care must be taken that they be shut up again upon the approach of rain.

When the fruit is ripe and beginning to drop, nets should be suspended under the trees for the fruit which falls to drop

into, but it should always be borne in mind, that such fruit which is allowed to remain on the trees till it fall of its own accord, is much injured in its flavor, therefore it should be gathered by the hand when ripe, or rather before it becomes too ripe. Many ridiculous inventions have been puffed up under the name of peach-gatherers, but the safest and best is the hand; the sense of feeling is sufficiently acute in most people who have the gathering of such delicate fruits, as to be able to tell, by a very slight touch, when the fruit is fit or not fit for pulling.

When gathered from the tree it should be carried to the fruit-room, and carefully placed upon clean paper, if not immediately wanted for use. Peaches may be beautifully colored or spotted, by sprinkling drops of water upon them when the sun is shining fully upon them.

FORCING GRAPES.

The crop will now be fast approaching to perfection; but as, after the fruit begins to color, water should be withheld, it is necessary, as was hinted at for the peach-house, that a careful examination should be made to detect the appearance of the red spider, which, if any should appear, and not entirely banished at this time, will not be so readily expelled afterwards, as the process of watering must be withheld, so as not to diminish the flavor of the fruit. If any of this arch enemy be detected upon the leaves of the vines, they should be well syringed from both ends of the house, that no leaf may escape the action of the water; and any leaves much infested, should be removed, so as to prevent, as much as possible, the spreading of the enemy through the house. The house should also have a slight fumigation of tobacco-smoke, for the annoyance of the green fly and thrips, should any of these appear; but should they not make their appearance, it is still necessary to fumigate, for prevention. On the appearance of the spider after the watering has been discontinued, flour of sulphur may be successfully sprinkled upon the flues when considerably heated, or it may be sprinkled upon the affected leaves.

The vines should be examined, and all those unnecessary shoots, which have been already noticed as useless, removed by the means and in the manner before directed, so that no expenditure of the strength of the vines may be permitted, which will now be wanted for the nourishment of the wood and fruit. Those shoots which are retained for bearing next year, should be neatly and carefully tied into the trellis as they advance. All superfluous laterals, tendrils, and decayed leaves, should be removed, as causing confusion, and robbing the vines of a considerable portion of their strength.

The fruit should, as it becomes colored, be exposed as much as possible to the light and sunshine; but this is not to be done carelessly by sacrificing too many of the leaves, which is often done to the injury of the fruit. A few of such leaves as are overshadowing the fruit, if they cannot be put aside, should be cut off, leaving the whole length of the foot-stalk of the leaf remaining. The grapes will swell much better in a partial shade than when fully exposed to the sun; their color, however, will not be so high, neither will their flavor be so good as if they were more exposed.

Water should now be withheld from the roots; the syringing should also be discontinued by degrees, and entirely left off when the fruit begins to color, otherwise the fine bloom which enhances the appearance of the fruit will be destroyed, and the flavor will be less saccharine. The state of the weather will now probably admit of the fires being also discontinued, but this must be always determined by the indication of the thermometer. In wet, cloudy, or damp weather, slight fires may be necessary to prevent any decay among the fruit from damp; all berries, as they appear in a decaying state, should be instantly removed, and many of them, from the unavoidable wounds they may have received from the sharp points of the thinning scissars, will show symptoms of rottenness; these should be all removed before they infect their neighbours. If the weather continue damp after the fruit is ripe, they should be looked over frequently, to prevent all disposition to decay; if this be not attended to, many of the largest and finest bunches will be spoiled.

In gathering the crop, it is most usually done as it may be wanted; the vine possessing this important advantage over most other fruit-bearing trees, that the fruit will remain a longer time after being ripe upon the trees without being injured; and some kinds of grapes are materially improved by remaining upon the vines until they begin to shrivel. A free circulation of air, and every means used to prevent any humidity in the house, are conducive to this effect; and when the bunches are cut for use, they should be examined as to their ripeness, for sometimes those bunches which appear the highest colored, and in other respects to be ripe, are really not so ripe as others, which, from appearance only, would be supposed to be less so. The cultivator, in this case, has a sure criterion to go by, as he can taste the fruit, and readily judge, by the flavor of one or two, of the state of the whole bunch. Those berries which are nearest the bottom of the bunch are generally the longest in ripening, these, therefore, should be chosen for the test; and if they be found to possess sufficient flavor, the whole bunch may then be concluded to be ripe. When the bunches are cut, it should be as close to the shoot from which they issued as possible, that is, within an inch or so, leaving as great a length of fruit-stalk to the bunch as can be obtained. They should then be put into a flat fruit-basket, in which is placed a piece of fine paper, to prevent the bloom from being destroyed; and when it is necessary to move the bunch, it should be done by taking hold of it by the foot-stalk, and not by handling the berries. Any of the stalks that supported the berries, which may have been taken off for tasting, or which may have been removed in consequence of becoming decayed, should be neatly cut out with a pair of fine-pointed scissars, so as to give the bunch as entire an appearance as possible.

During the time from the berries first becoming colored till the crop be all cut, as much air as possible should be admitted into the house, in order to improve the flavor of the fruit and assist its coloring. For this purpose, the sashes should be drawn down to a considerable degree every fine day, but immediately drawn up again on the appearance of rain.

In proportion as the fruit attains maturity, many of the leaves, from various causes, will appear lifeless; their office being completed, they may be removed, for the purpose of admitting as much light and sun to the remaining crop as possible, as well as to ripen the wood for that of the succeeding crops

They should not, however, be removed until they be of no longer use to the plants. Their removal will also clear the house of any remaining spiders, or other insects, that may have made their appearance since the watering has been desisted in.

CUCUMBERS AND MELONS

The cucumbers in frames will still require attention. Water and air should now be freely supplied to them in larger portions than hitherto. They will now require to be watered every or every alternate afternoon at least. Several persons only water once or twice a week; but it is much better to give this very necessary element often, and in less quantities at a time. They should be freely watered over-head with a moderately coarse rose watering-pot, so as to wash off the dust from their leaves, which to all plants is always extremely injurious, as the dust falling upon their leaves stops the pores through which they are supposed to breathe, and which must, consequently, be highly detrimental to them. Independently of which, there is something so congenial to the growth of cucumbers in a humid atmosphere, that frequent sprinkling with water is necessary to their welfare.

The plants should now have air freely given to them, by tilting up or drawing down the sashes according to the state of the weather. Unless it be cold, and very wet and cloudy, the linings need not be kept up so strong as hitherto; still it would be advisable to keep up a moderate temperature for the welfare of the plants. Towards the end of the month, the plants, if in frames, may be allowed to extend their shoots from under them, by having the frames lifted up, and supported upon bricks or other props at their corners. The linings should, in that case, be earthed over, for the vines or shoots to run upon; for, by this means, the plants will extend

themselves to cover a greater surface, and consequently produce a greater quantity of fruit. However, if the weather be not very favorable, this operation may be deferred till the beginning or middle of the following month. Those cucumber-plants which were last month planted out on ridges, and covered with bell or hand-glasses, may now be suffered to extend freely from under them, protecting them at nights, as already directed last month, with mats, or other coverings. For this purpose, the glasses should be propped up, for the more ready admission of the extension of the shoots.

These plants will require frequent supplies of water, but not so frequent as those which are confined in the narrow limits of a pit or frame. It is better that they be kept rather dry than otherwise, particularly until the end of the month.

The cucumber-plants sown last month in the natural ground to produce picklers, should be thinned, when the rough leaf begins to advance in the heart of the plants, to the distance noticed last month. From this time, let them be kept clear of weeds, which can be easily done by carefully hoeing them; and this practice will not only make the ground look neat, but will materially promote the growth of the plants. As the plants advance, let a little fresh mould be applied round their roots and stems, which will greatly strengthen and support them. They should be refreshed with water every day, if dry weather, but this must not be given in too large a quantity at once.

Cucumber-seeds may still be sown, if not done last month, for a full crop of picklers; for directions on this subject, see *last month*. The plants now sown will come into bearing by the middle or end of August, and will continue generally until destroyed by the autumnal frosts.

It was intimated last month, that it would be advisable, in order to forward a crop of these plants, to have such a number, as may be wanted, raised upon a bed or beds, to be finally transplanted where they are to remain, to perfect their crop. At this time, such plants so forwarded will be in a fit state to be transplanted where they are to remain, and should be now attended to. (For directions for planting out, &c., see *last month*.)

The successional crops of melons in pits or frames, will still require attention ; care must also be taken that they be shaded from the sun, when they show any symptom of flagging or drooping their leaves. This should be particularly attended to, where the plants do not stand the sun well, but shrink or flag their leaves considerably, or where they are situated too near the glass, as the full noon-sun would be apt to scorch their leaves, and in some degree shrink or exhaust the juices of the plants, whereby the advancing fruit would be checked, assume irregular shapes, and become stunted in its growth.

This disposition to flag proceeds from a variety of causes ; the principal of which is, when the mould in which they are planted is too light for them, or where the dung in the beds has sunk unequally, and thereby caused the mould to crack in various directions, and by that means tear and destroy the roots. It also often happens when there has been a long continuance of dull cloudy weather, succeeded by powerful sunshine. From whatever cause this appearance is derived, it is of so much consequence to the future welfare of the plants, that means must be used to counteract its effects. This is to be remedied simply by shading them, by covering the sashes with a thin mat, or sprinkling dry litter, hay, or straw, over them, during the time the sun is most powerful. But this shading must not be carried to an extreme, for the plants should be gradually accustomed to sunshine, until at last they are enabled to stand it without injury.

The plants should now have a large share of air admitted to them by propping up the sashes, or pulling them down, and drawing them up alternately.

Water must be frequently administered to them, but not in large quantities at a time, preferring to give it frequently, say every, or every other afternoon, as soon as the sun is sufficiently off the frames to prevent scorching. The extreme parts of the beds will require the most water, not only because the major parts of the roots are supposed to be extended round the sides of the bed, but also because those parts are more liable to be dried up by the heat of the linings while they are applied, and by the action of air upon the sides of the beds when the linings are discontinued.

It is not proper to give much water near the main-stem, either of melons or cucumbers ; and as the fruit of the former attains its full size, water should be gradually withheld, giving only a sufficiency to keep the plants alive. If the beds have been moulded up to a proper depth, slight waterings will at all times be sufficient for melons, but not by any means to that extent, which is given to cucumbers. While the plants are setting their fruit, water should be sparingly given ; and when any tendency to damp or mouldiness appears, it should also be withheld, and all dead or decayed leaves or shoots removed. Too much humidity would prevent the setting of the fruit, and make them turn yellow and damp off ; but when a sufficient number are set, and beginning to swell, water may be more freely given, never, however, too abundantly, as too much moisture proves hurtful to the roots and stems of these plants, and causes them to rot and decay. Continue still to cover with mats every night till towards the end of the month, when the covering may be dispensed with.

If melons were planted out last month under hand or bell-glasses, they should now have full liberty to extend their shoots from under them, as already directed for cucumbers ; for this purpose, if the glasses be raised only two or three inches, it will afford sufficient room for the branches or shoots to escape. As yet, little water will be required by these plants ; too much of it would tend to rot or chill the roots, and thereby prevent the setting and even first swelling of the fruit. When the weather is naturally wet, water from the pots may be dispensed with, and care taken that the plants be protected from too much of it, either by means of canvas, supported upon hoop arches placed across the beds, or by covering with Dutch reed-mats, which will carry the water off sufficiently. The glasses should be kept constantly over them, and air admitted by propping up the glasses by wedge-shaped pieces of wood, or other similar contrivances.

Frames covered with lights fitted with oiled-paper instead of glass, are extremely useful in the cultivation of melons at this season, when more of that fruit is required than can be conveniently grown under glass ; and by such means, the cultivators for the markets are enabled to grow a great quantity

at much less expense, than by using lights of glass entirely. Such frames may be made exactly similar to those, which are made to be covered with glass sashes, or they may be made of inch-and-half boards, extending the whole length of the bed or ridge without any divisions, and the back and front connected by rafters, on which to support the sashes. Such frames, if taken care of, will last for many years, and the lights may be used for protecting the blossoms of peaches, nectarines, &c. in spring, as hinted at in the *Fruit Garden*.

Some gardeners use these frames from the beginning, but the proper time for having recourse to them is when the plants have been forwarded under hand or bell-glasses, till their runners require training out beyond the limits of the glasses, which is generally the case sometime in the course of this month. These paper screens should entirely cover the bed and plants, over which they are to remain during the rest of the season; they will afford protection from heavy rains or tempests, as well as from nocturnal cold, and also screen the plants from the excessive heat of the sun, as being pellucid, they effectually admit the influence of light and warmth.

Where the ridges for melons have been made parallel to each other, the spaces between them should be filled up with leaves, dung, or the refuse of the garden, such as leaves of cabbages, weeds, and other fermentable matter; this will give additional heat to the beds, and when filled up, increase the space on which to train the plants. The general management of them now differs in few respects from that of those in pits or frames. (For earthing up, setting, training, and pruning, see the *preceding month*.)

Melons are subject to be infected and injured by the mildew, and also by the canker. These diseases here, as in all other cases, proceed from bad management; that is, the climate is bad in which they live. There may be an insufficiency of heat, and the dung and mould are then too moist, by which a stagnated heat is produced; or it may arise from damp, occasioned by over-watering or imperfect sashes, and not unusually from injuries sustained in their branches, by being bruised or too much cut at once. Nothing will prevent plants from the attacks of insects or disease but heat sweet air, and

a sufficiency of water, which greatly tends to sweeten the atmosphere, and makes it congenial to vegetables as well as to animals. Nothing will eradicate disease from melon-plants but plenty of heat, and a due portion of water sprinkled all over their leaves, and air given in a quantity sufficient to keep the atmosphere of the beds pure, and also in a state of change. Plants much diseased, or much infested with insects, never can produce good fruit. The mildew generally makes its appearance upon the old leaves of the plants of melons, and also on the extremities of the young shoots, and is caused by their not having healthy nourishment comprehended in the elements in which they grow, or that those elements do not harmonize in the proportion of the growth of the plants. It is observed by cultivators, that when a bed gets into a stagnated sour state, the plants cease to prosper, the air in the frames becomes saturated with unhealthy particles, and so also must the juices be, which are imbibed by the plants by their roots or leaves. These, consequently, breed diseases, if means be not used to prevent them.

Melon-plants at all times, particularly when approaching to maturity, are subject to the attack of that minute and destructive enemy, the red spider. Whenever the temperature is high, and water withheld for any length of time, it is almost sure to make its appearance. Upon most plants it is easily got rid of, by simply attending to use the garden engine or syringe freely, and with considerable force upon the parts infected; but upon melons it is not so easily subdued, as those means can seldom be applied, considering that too much moisture applied would injure the plants, and the necessary force required to dislodge it, would be more than the tender frame of those plants could bear with safety. The following remedy has been recommended by M'Phail, and we have always found it effectual in practice: "Get plenty of horse-dung, thrown up into a large heap; turn it over once or twice, shaking and mixing it well, and let it lie till its rankness be somewhat evaporated; if there be linings at the beds, take them entirely away, examine the dung in the beds, and if it be wet and have 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 plants can bear. A heat of 120° 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 clear water, 100° warm; and if the sun shine, keep the lights shut closely down all day, and cover them up in the evening, leaving a little air at each light all night, to prevent a stagnation of air amongst the plants. Continue this process till the mildew and insects disappear and the plants appear to grow freely, and afterwards manage them in the usual way, taking care to keep up a good heat in the linings. This method sets the old stagnated bed into 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 frame sufficiently, let some of the earth in the inside, all round the sides of the frame be removed, to let the heat of the linings rise freely into the frame. If the plants be kept in a healthy free-growing state, few insects and diseases will attack them; but if they be allowed to experience a check, from want of sufficient heat, a too liberal supply of water, or such like, then insects and diseases quickly follow."

J U L Y.

PINE-PLANTS.

The directions given last month, as well as those in the preceding one being fully attended to, nothing requires to be said upon this subject till the beginning of August, unless it should so happen that the general crop of pines are cut, and many other plants being in the succession or other pits are in a state of forwardness, and intended to be fruited in autumn; then the directions to be laid down next month for the general arrangement of the house, will be applicable to this month, and may be proceeded with accordingly.

PEACHES.

The crop of fruit having been gathered, and the sashes removed during the day, for the immediate purpose of improving the flavor of the fruit, the trees will have been sufficiently accustomed to the rays of the sun to admit of the lights being wholly removed this month, with the view of being employed to accelerate the ripening of late peaches or vines upon the flued walls; or, if not wanted for that purpose, to be removed to the back sheds, to remain there till again wanted. After the fruit has been gathered, the peach-trees should have a hearty watering, both at their roots and also over their heads, with the garden-engine or syringe, applying the water with force for the suppression of the red spider, and also for refreshing the trees; which, during the time of the ripening of their fruit, will have had no water given them.

As the leaves ripen, they should be gently brushed off, to admit the air and sun to the branches, in order that they may be sufficiently matured for next year's forcing. Many of the shoots will spring into a second growth, if supplied too bountifully with water after the house is thrown open; but this watering need not be given in such abundance. Those shoots

which spring are generally only such as are luxuriant, or not fully matured, the consequence of which is of very trifling amount.

The directions given for the treatment of the peach-house, in the preceding months, are to be applied to those peach-houses which are coming in, in succession, making a proper allowance for the season.

VINERY.

The crop will now be ripe, and probably all cut, if not retarded or saved for particular purposes; if such be the case, attention must be paid to keep up a free circulation of air, and to remove all appearance of decay in the bunches, by taking off all decayed berries, and keeping the interior of the house as dry as possible, unless the vines show evident signs of a want of water, which is not often the case, if they have been managed according to the foregoing directions, and the borders have been previously well formed. In damp or cloudy days, it may be necessary even now to light slight fires, for the purpose of drying up the moisture in the house; but this should be done during the day, and air given at the top of the house, to give the steam, which may evaporate more or less from the borders, free means of escape, as well as to keep the thermometer from being materially affected. A cool dry atmosphere is what is wanted for their preservation, and all means likely to promote that end should be resorted to. Coal-ashes, decayed granite, or trap, the two latter of which have been found by Professor Leslie to be powerful absorbents of moisture, may be scattered on the floors and flues of the vinery, or any other absorbent matters which circumstances or situation may offer. Coal-ashes are most generally used, as being within the reach of every one, who has hot-houses heated by coal fires.

At this season, the fruit will remain for several weeks (particularly some of the thicker skinned kinds) upon the vines, without injuring either the trees or the fruit; or, if required to be kept for any greater length of time than may be found convenient in this way, the bunches may be cut and suspended

from rods or strings in any cool airy chamber or fruit-room; but where there is the convenience of an ice-house, or ice-cold chamber, these places will be much preferable, taking care in all cases to remove such berries as begin to decay, before they contaminate the rest.

The fruit being all gathered, those shoots which produced fruit this season and are not really wanted for the purpose of producing similar shoots for a succeeding crop, should be pruned off, to give more room for those which remain, and also for such strong shoots as may have been retained for the like purpose; and any of these latter, which from want of sufficient room, or other reasons, may have warranted their being suspended below the rest of the vines, should be taken up and tied in close with the other, so that they may enjoy all the benefits of the sun, and air to facilitate their maturation.

The border should also be now watered, to such an extent that the water may freely penetrate to the lowest roots, but this watering should not be effected at one time; beginning gradually, and continuing until the border be sufficiently moistened. This moisture is necessary to be continued until the leaves begin to drop, when it may be entirely dispensed with. The engine or syringe should also now be applied with sufficient force to dislodge such insects as may have made their appearance during the suspension of watering. The weather being now more favorable to their propagation, they will at this time be in myriads on almost every tree, particularly such as may be termed *asperifolius*, or having their leaves bisect, with strong harsh hairs, such as the *ulmus*, *rosa*, and many others.

The house should be now kept as open as possible night and day, that the leaves of the vines may be gradually accustomed to stand the full force of the sun without the intervention of glass, preparatory to the lights being entirely removed, either for the purpose of being applied to ripen late grapes or peaches upon the open or flued walls, or for being removed to the sheds until again wanted the ensuing season; or they may be drawn down to their full extent, and left so: but this latter practice will not look so well, and the glass will be liable to be broken and the sashes injured.

Many excellent cultivators never uncover their houses, and indeed the first horticultural architect of the day agrees with them in that opinion. In the many excellent houses erected from his designs, the sashes are made permanent, and ventilators are fixed in the front and back walls.

Vines thus early forced, will ripen their wood sufficiently in the open air, without the aid of glass at this season; but those, which are late in ripening their fruit, should have the glass kept on at least until the wood be sufficiently ripened. Some persons are advocates for entirely exposing them, while others advocate the glass being kept on. The end aimed at by both, is the attainment of fully ripened wood; and if that be completely effected, it matters little by which of the means it is accomplished. Those, who merely keep the glass on for the sake of saving the flues and decorative parts of the structure, often sacrifice a more important object than that which they gain. All decorations in culinary hot-houses should be dispensed with, excepting what are necessary and useful, for in such structures that only is in good taste, which is of real utility. In the green-house, conservatory, and tropical plant-stoves, fancy or taste may be certainly consulted; but the plainer the houses are which are intended to bring fruits early to maturity, or to perfection at a later season, the better; provided they be got up in a respectable and neat manner. We have seldom found injury done to the flues by being thus left exposed by the removal of the sashes, and never to such an extent as would induce us to prefer keeping them on.

The crop being gathered, there remains nothing more to be said upon this subject till October, when it will be again mentioned. Where there are other grape-houses coming in, in succession, their management will be exactly such as laid down in the preceding months.

MELONS FOR LATE CROPS.

Melons for crops to ripen in November and the beginning of October, may be obtained by growing them in flued pits, such as are used for nursing young pine-plants, or in pits of any ordinary construction, having pipes laid in them for the

circulation of hot water, which pipes will take up but little space, the diameter of five or six inches being sufficient; and as the first course of pipes will be placed perpendicularly to the lower or returning pipe, less room will be occupied than by using flues of the smallest dimensions. About the middle or end of this month, those plants which are intended for such late crops may be planted out. It is not, however, to be expected that fruits, especially melons, which require all the sunshine we have in the hottest months to bring them to perfection, will either be fine or high-flavored, ripening so late in the season. Plants for this purpose should be raised from seeds sown the latter end of last month, or even the beginning of the present, in any other melon-pits or frames in use. The process of sowing, rearing, and finally planting out being the same as has been directed for melons for more early crops, with this difference, that they can be more depended upon, and as few accidents will attend them, we need not again enter upon that head. The pit is to be filled with well-fermented dung, if considerably exhausted the better, as a mild heat only is required; or, if composed of dung and half-decayed leaves, or tanners' bark, it will give a more lasting and mild heat. This being prepared, and the plants planted out about the third week in the month; the bed may be earthed all over at once, or an addition made to it, as occasion may require. The general management of them from this time till September, when they will be again noticed, will not differ from that of the plants now in their respective stages of growth, either in pits, frames, or under glasses, &c.

For this crop, it is necessary to select sorts of the earliest description; the rule holding almost always good, that those which are the best suited for early crops, are also the fittest for late ones.

AUGUST.

PINE-PLANTS.

Upon the supposition that the fruit be all or nearly cut, a general arrangement of the pine-plants will now be necessary. The old stock of plants, which has just produced their fruit, and has been left in the fruiting-pit to perfect their suckers, is now to be removed entirely out of the house; the suckers carefully twisted off, and laid by in some convenient place till they become a little dry, which will be sufficiently effected in the course of a week. The old plants, now divested of their suckers, are to be thrown away altogether; the bark or leaf-bed thoroughly turned up, and all the exhausted matter carried away. While these operations are going on, it will be convenient to have the flues cleared of soot, and any trifling repairs done to the walls, flues, or roof of the house, that may be deemed necessary. The bed should be again filled up with such a proportion of fresh tan or leaves as will again raise it to a sufficient height. These new materials, as has been already noticed, should, in the operation of mixing, be kept well down towards the bottom, and a sufficient quantity of half-decayed tan or leaves brought up to the surface, in which the pots will be plunged. While the bed is thus preparing, select out of the succession-pits a sufficient number of plants, with which to fill the fruiting-pit again. If it be intended to fruit another set of plants during the autumn, such being considerably advanced already, they are to be fitted for going into this stage of growth by following the same directions as were laid down in February, as far as regards shifting, plunging, and otherwise arranging the plants.

But if it be intended, which is more generally the case, that the fruiting-pits be now filled with those which were succession-plants formerly, and which will now be healthy and strong, if the directions given in the foregoing months have been attended to; preparatory to their being removed into the fruiting com-

partment, it will be necessary that they should be examined as to their want of shifting into larger pots, &c. The directions regarding potting, already given, both as to the mode of performing the operation, as well as the sizes of the pots being kept in view, we need not dwell longer upon that subject, only so far as to say, that the largest sized plants will require pots from twelve to fifteen inches in diameter, and the less strong, proportionably smaller. The pots we would recommend for pines are rather different from those in common use, being not so deep in proportion to their diameters as the pots usually used. We would prefer pots whose depth correspond nearly with their diameter, as being much less likely to risk the burning of the roots of the plants.

The plants being potted, and a little water given to settle the mould about their roots, let them be plunged into the bed about three parts of their depth, for fear of too much bottom-heat; which, if permitted at this time, while the plants have been checked by being repotted, would be liable to start them into fruit, which, at this season, would be far from a desirable circumstance. After they have thus stood for some time, till the violent heat of the bed may have subsided, they may then be fully plunged up to their rims, observing that, in so doing, to set the pots level, and to endeavour to keep them so, by pressing the leaves or tan tightly round them on all sides. The plants should be allowed as much room as possible, not less than eighteen inches from the centre of one pot to that of the next; when they are all plunged, give them a little water, which repeat more freely when the heat has come up. It will be also necessary, after the house has been regulated and cleared out, to give the plants a good washing over-head with the syringe, to clean them of any dust that may have fallen upon them during their removal and potting. After the heat in the bed has come to its full height, watering must be attended to forthwith, in a regular and moderate quantity. The plants must now be kept going on in a steady genial growing heat, supplied with plenty of air when the sunshine is powerful enough to raise the temperature above 80°, which point it should seldom exceed, but be regulated from that to 75° in the day, and from 65° to 68° during the night. This

treatment will be the means of keeping the plants in a fine growing state without endangering their starting into fruit, which, of all things at this season, should be guarded against; for those which start into fruit at this time, may be considered tantamount to being lost.

The plants in the nursing-pit will now have to be put in order to bring into the succession-house, to be there forwarded for fruiting-plants in the course of a year. Many, if not all of them, will require to be repotted, at least most of the strongest of them. The bed in the succession house should be prepared for them, as already directed on former occasions, still keeping down the new or fresh tan or leaves towards the bottom. The flues of this compartment should also be cleaned, and all necessary repairs done to the walls, flues, and roof of the house; the walls should also be whitewashed with lime and water, to give the whole a lighter and neater appearance.

The plants being potted into pots suitable to their respective sizes, should be arranged in the bed in a regular manner, keeping the tallest towards the back and the smallest in front. After being all arranged, the whole should be watered at their roots, and be syringed over-head.

The crowns and suckers, which have been collecting and rooting in the frames or in the front of the nursing-pit, should now be all potted; that is, all those which are rooted and brought into the nursing-pit, to be there forwarded to occupy the succession-pit the ensuing year, and the bed there made ready for their reception, as already directed for the succession-pit. After the plants are plunged, and watered at the roots, let them be syringed over-head, but not immoderately, as they will not be able to resist so much water as those which are farther advanced in growth. Those crowns and suckers which were taken off the old plants, and had been laid by at the commencement of the regulating of the fruiting-pit, should now be planted in the frames in rotten leaves or tan; these beds having also been previously forked up, or renewed for their reception. Some of the strongest suckers may be potted at once in small pots, in light vegetable mould, and they will strike root as freely as those in the rotten tan or decayed leaves.

Our principal object in so disposing of them in that way, is, that they thereby require much less room than if potted, and we have always found them strike roots as freely in that way as when potted from the first. In these frames they may remain till the beginning or end of October, and should then be removed into the nursing-pit, if there be room for them; if not, without crowding the whole too much, the best and strongest should be picked out for that compartment, and the weaker or less valuable sorts kept all winter in frames or melon-pits, if there be not a division of small pine-pits for this purpose, in which all supernumerary and small stock can be kept without fire-heat during winter. This indeed will be no difficult matter, for pines can be wintered in well-constructed pits, and even brought to produce good fruit, by means of dung-heat alone; but they are attended with more trouble, and in many cases with more expence, than where there are pits furnished with flues. The whole stock being thus disposed of, a brisk and lively heat is necessary to be kept up in the nursing-pit and frames; which, if the beds be properly prepared, will be sufficient for some time to come, in order to induce the plants to make good roots. There is, however, a line of moderation to be observed, which every one who manages pines will endeavour never to exceed. Those suckers which are potted without roots should have no water for some days after potting, or at least until the heat in the beds becomes pretty brisk; neither should they be so frequently watered, nor so copiously, as those which have already been furnished with roots, and none over the tops until they be better established, and the heart-leaves beginning to grow. Afterwards water may be freely given at the roots, and occasionally over the leaves. Air should not be very freely admitted until the plants have emitted roots, and are beginning to grow; and during this time they should be partially shaded from the effects of the full sun, gradually accustoming them to bear it as they get established with roots. After they are pretty well rooted, air should be given them freely, so as to keep the temperature during the day from 80° to 85°.

INSECTS AND DISEASES TO WHICH THE PINE IS LIABLE.

Diseases, the pine may be said to have none; and such insects as are found upon them are the effect, and not the cause of any sickly appearance that they may assume. When pines are well managed, and kept in a vigorous, free-growing state, they are not only exempt from insects, but if they should even be introduced amongst them, they will not “*annoy, but leave them.*”

The *white scaly coccus*, or *mealy bug*, is the most injurious insect to the pine, and although it appears almost inanimate, it will soon, if not removed by the application of certain compositions, which appear to be destructive to them, be of infinite injury to the plants; but the best of all cures is good management. Speechly and others describe another enemy of this genus, probably a sub-variety of the former, and which is called the *white mealy crimson-tinged insect*. The brown *turtle insect*, or brown scaly coccus, *Coccus hesperidum*, or bug, also infests the pine. It is nearly allied to the first, but not so injurious in its effects.

Many methods have been tried for the destruction of these insects, with more or less effect. The following receipts have been used by persons long celebrated for their successful culture of the pine:—

“ Miller recommended turning the plants out of the pots, and clearing the roots; then keeping them immersed four-and-twenty hours in water in which tobacco-stalks have been infused: the bugs are then to be rubbed off with a sponge, and the plants, after being washed in clear water and dripped, are then to be repotted.”

M'Phail recommends the application of a strong and powerful moist heat, founded upon the fact, which has been experimentally proved, that a high and moist temperature is speedily fatal to animals, while it does not injure vegetable life; thus a moist and high temperature appears also congenial to the growth of pines, and while it is kept up, no insects will attack them.

Nicol recommends the following preparation for cleaning such pines as are attacked with bugs; at the same time, he

considers that if the plants be properly managed, no insects will infest them:—“Take soft soap one pound; flour of sulphur one pound; tobacco half a pound; nux vomica an ounce; which boil altogether in four English gallons of soft water, down to three gallons, and set it aside to cool. In this liquor immerse the whole plant, after the roots and leaves are trimmed for potting. Plants in any other state, and which are placed in the bark-bed, may safely be watered over-head with the liquor, reduced in strength by the addition of a third part of water. As the bugs harbour most in the angles of the leaves, there is the better chance that the medicated water will be effectual, because it will there remain the longest, and there its sediment will settle. The above is a remedy for every species of coccus, and for most insects, on account of its strength and glutinous nature. Its application will make the plants look dirty; therefore, as soon as the intended effect may be supposed to have followed, whatever remains of the liquor on the leaves should be washed off with clean water. It would be imprudent to pour a decoction charged with such offensive materials over fruiting plants. Farther, this peculiar dose, for a tenacious insect, is not to be applied indiscriminately to exotics in a general stove, as it might make the more delicate leaves of plants fall off.”

Baldwin recommends to “take horse-dung from the stable, the fresher the better, sufficient to make up a hot-bed three feet high, on which 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 fagots, 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 a tub of cold water previously brought to the side of the bed, then set them in a dry place, tops downwards, to drain, and afterwards plant them. This treatment is sure to kill every insect. It must be observed, likewise, that the crowns and suckers in the beds

heated by linings of dung, without fire-heat, will have all their insects killed, or be kept free from them, if they were clean when planted by the effluvia of the dung." Mr. Knight concludes, "that the destructive agent in this case is *ammoniacal gas*, which Sir H. Davy has found to be instantly fatal to every species of insect; and if so, this might be obtained at a small expence, by pouring a solution of crude muriate of ammonia upon quick lime. The stable or cow-house would afford an equally efficient, though less delicate fluid. The ammoniacal gas, Mr. Knight supposes, might be impelled by means of a pair of bellows among the leaves of the infected plants, in sufficient quantity to destroy animal life without injuring that of the vegetable; and, he adds, it is a very interesting question to the gardener, whether his hardy enemy, the red spider, will bear it with impunity."

Griffin recommends: "To one gallon of soft rain-water add eight ounces of soft green soap, one ounce of tobacco, and three table-spoonfuls of turpentine; stir and mix them well together in a watering-pot, and let them stand for a day or two. When you are going to use this mixture, stir and mix it well again; then strain it through a thin cloth. If the fruit only be infested, dash the mixture over the crown and fruit with a squirt, until it be all fairly wet, and that which runs down the stem of the fruit will kill all the insects that are amongst the bottom of the leaves. When young plants are infested, take them out of their pots, and shaking all the earth from their roots, (tying the leaves of the larger plants together,) plunge them into the above mixture, keeping every part covered for the space of five minutes; then take them out and set them on a clean place, with their tops declining downwards, for the mixture to drain out of their centre. When the plants are dry, place them in smaller pots than before, and plunge them into the bark-bed."

Muirhead, in a communication in the Mem. of the Caledonian Horticultural Society, recommends immersing the plants in a tub of water, in which there has been mixed one pound of sulphur to every watering-pot full of water. With a bit of bass-mat fixed to a small stick, which he dips in water, he displaces as many of the insects as he can; he then immerses the

plants in the liquor, where they remain for twenty-four hours ; they are, when taken out, laid with their tops downwards to dry, and are repotted in the usual manner. It does not very clearly appear, what share either the tobacco used by Miller, or the sulphur used by Muirhead, has in the destruction of these insects, or whether the water alone, without mixture of any kind, would not answer the same end ; the rubbing off the insects, which the water loosens from the leaves, appears the principal part in the cure. Without stopping to solve this question, Muirhead certainly cleared his pine-plants of insects in a short time, by no other means ; and of this fact we had ocular demonstration. Muirhead is one of the best cultivators of pines in Scotland, and his general good culture and assiduity may be the real cause of his pines being healthy and clear, more than any virtue in his sulphurated water.

Speechly recommends the following receipt, which he long used with success in the Welbeck Gardens : " Take one pound of quicksilver, put it into a glazed vessel, pour upon it one gallon of boiling water, which let stand till it gets cold ; then pour off the water for use. Repeat this on the same quicksilver (for it will retain its power) till a sufficient number of gallons are provided to fill a vessel intended for the purpose : one in the form of a trough, that will hold eight or ten gallons, is the most convenient, especially for the large-sized plants. To every gallon of this mercurial water, add six ounces of soft green soap, dissolved in a portion of the prepared water ; let the mixture stand till it becomes about milk-warm, which is the degree of warmth to which it must be kept during the time of dipping ; which operation is performed in the following manner :—Before the plants be taken out of the pots, I would," he says, " advise the brushing off a few of the scaly insects, as in a common dressing, especially towards the bottom of the leaves, where they will sometimes be so numerous, as in appearance to lie one upon another ; in which case, the mixture might be prevented from penetrating to the bottom insects. The leaves of the larger-sized plants should be tied together, as they will be more manageable in this form than with their leaves loose, and less liable to be damaged. The plants should then be taken out of the pots, and divested of their

roots, as also a few of the decayed leaves at the bottom. The plants should then be put into the mixture, in which they should remain, with every part covered, for the space of three minutes; then take them out, first letting the tops decline for the mixture to drain out of their centres. The vessel should be immediately filled with fresh plants, and those taken out set in the open air to dry, with their roots downwards; for, by placing them in that position, the mixture will descend, and penetrate to the very bottom of the leaves in the centre of the plants, whereby the insects, which are concealed there, will be totally destroyed. The mixture will change the plants to a sad green color, which will give them the appearance of being spoiled; but as they become dry, they will in a great measure resume their proper hue. During the operation, it will be necessary to add a supply of hot mixture, in order to keep the whole to a proper degree of warmth, as also to make up the deficiency which will naturally happen." The plants having been thus treated, are to undergo a second dipping in the same manner, which will completely clear them of these insects. In preparing the liquor for a second dipping, he directs to add one table spoonful of sweet-oil to every gallon of the mixture. If the oil be incorporated in two ounces of green soft soap and a little warm water, the oil will more readily incorporate with the mixture.

PEACHES AND NECTARINES ON THE HOT WALLS.

From this time, and until the fruit and wood have been fully matured, is the most eligible season for applying fire-heat to flued or hot walls. To attempt to accelerate their growth in spring, by hard forcing, is a most injudicious practice. It is attended with the danger of not only losing the crop of fruit, but also the lives of the trees, of which there is sufficient evidence on record to prove; and almost all attempts to forward a crop by such means, have rarely or ever been equal to those, which have come on naturally until this season, and then been assisted by a slight heat, till they

have ripened. Where there are a great many forcing-houses, the crops of one or two, or more, may by this time be gathered; and as the lights are better off than on, they may be placed on portable rafters against those hot walls, which are intended to be brought forward, and thus accelerate the crops, in many cases, without the aid of fire-heat; or, if fire-heat be added, the maturation of both fruit and wood will be hastened.

The middle or end of the month will, in most cases, be early enough to apply fire-heat, whether the trees be covered with the glasses or not; that, however, must depend greatly on the season, for sometimes we have cold and wet weather in August, and in that case, the fires may be sooner used. At all events, whenever fire-heat is applied, it should be only in moderation; for nothing can be more injurious to the trees than to be placed close against a burning heat on the one hand, whilst the other, as has been observed in April, is exposed to all the vicissitudes of the weather. The fires should be made moderate at first, increasing them by degrees as the cold weather advances. They should be lighted in the afternoon about four or five, and made up for the night by eight. The cavities, if the walls be built hollow, or if only with common flues, will be sufficiently charged with heated air, which will be given out through the bricks gradually during the night. The surface of the walls next the trees, should seldom feel above milk-warm at their hottest time. It should be particularly observed, not to increase the fuel or heat on cold nights, as is the case in the forcing-houses, otherwise both fruit and shoots may be damaged. A mild and steady heat is all that is required, and more than that would be productive of greater mischief than if the trees had taken their chance of the weather. If the fires be thus gradually continued till October, the fruit and wood will be sufficiently ripened. Some trellis the walls, as a preventive for not injuring the trees; no such precaution, however, is necessary, where due regard has been paid to the temperature of the walls, and it only serves as a plea for the more dangerous practice of heating the walls to an unnecessary degree; independently of which, the trees trained to such trellises are

placed beyond the power of the fire-heat, and a constant circulation of air going on between the wall and branches, they are kept, by that means, nearly as cool as if they were trained close to a common wall without any flues whatever.

CUCUMBERS DURING THE WINTER.

With a view to have cucumbers fit to cut at Christmas, a desideratum amongst gardeners, we cannot follow a better course than to give the following extract from a valuable paper in the Hort. Trans., communicated by Mr. Aiton, it being the practice adopted in the royal gardens. For this purpose, seeds of an approved early sort are sown on the twelfth, and a second sowing made on the twentieth of this month, with a view to cultivate them in stoves during the winter. The plants are raised in a well-prepared one-light hot-bed, and when the seed-leaves become nearly full grown, they are potted off into pots of the size known by the name of *upright thirty-twos*; placing two plants in each pot. When these pots become filled with roots, the plants are again shifted into pots of the size called *sixteens*, and removed from the seed-bed into a three-light box or frame, with a sufficient bottom-heat to allow of a considerable portion of air being given day and night, both in the front and back of the frame. About the middle of September, the plants having again filled their pots with roots, and become stocky, are taken from the frame to the *pine-stove*, and after a few days receive their last shifting, into pots of the following dimensions:—at the top fourteen inches over, the bottom ten inches across, and twelve inches deep, all inside; measure each pot at equal distances apart, having three side drain-holes near the bottom, and a larger one in the centre of the bottom, and each containing about three pecks of earth.

The plants now in these pots are placed on the front edge of the back flue of a pine-stove, on which flue is fixed a *façia-boarding* six inches deep, and extending the whole length of the house, forming all along a trough, or inclosure, for a reserve of compost after the exhaustion of the mould in the pots has taken place. The pots are here placed in

regular order on the mould-trough over the flue, at three feet apart, and remain in this station for succession. A setting of the second sowing is placed on the end flues of the house; underneath each pot is placed an upright circular garden-pan six inches deep, and fourteen inches diameter, which being filled with earth, the pots are placed therein about two inches deep, and the drain-holes being sufficiently covered with mould serve for outlets for the roots.

The temperature of the stove was kept up day and night at 60° or 65°, varying only a few degrees, when the sun or steam produced a sudden increase of warmth. The plants being established, and in vigour, require stopping for laterals and fruit, and those second and third lateral shoots, in their turn, are stopped also, and the blossoms from time to time set as usual for successional supply.

Water becomes necessary only when the surface of the pots becomes evidently dry, and then a slight sprinkling of soft water is given, after being tempered by standing some time previously in the stove; this is sprinkled over the leaves of the plants with good effect.

The house is occasionally steamed by pouring water upon the flues, which produces a fine genial vapour, evidently useful to the plants; but care should be taken that this operation be regulated, so that any scalding of the leaves from it when the vapour is too hot, may be guarded against.

When mildew appears, flour of brimstone, colored leaf-green, with a little soot, is sprinkled over the leaves and shoots affected; and copious fumigations of tobacco are given, to subdue such species of the aphis tribe as may make their appearance. By this simple process, cucumbers have been produced abundantly in the months of October, November, December, and part of January, in all the royal gardens, during a series of years.

Where there is not the convenience of a stove for the reception of these plants, a small pit, heated by hot water, will be found to answer the purpose of growing cucumbers during all the winter months; such pit, however, should be so constructed, as to admit of a person getting in with facility to examine the state of the plants, and to regulate them according

to their wants ; as, during that season, the sashes cannot be opened to admit of that operation without running a risk of having the plants injured by being exposed to the cold. Many gardeners, however, contrive to cultivate these plants so as to cut their fruit by Christmas, and often during all the winter months, by using only the common hot-bed and frame. This, however, is a precarious and laborious method, and cannot be effected except with plenty of dung, which is, for the most part, rather a scarce article in gardens. One great objection to the common dung-bed and frame for this purpose, is the too great abundance of steam, which naturally follows a strong bottom-heat, without which a sufficient temperature cannot be kept up during the winter months. To obviate this, pits have been built at the suggestion, we believe, of Mr. Gould, one of the assistants in the royal gardens at Windsor, and one of the most successful cultivators of this plant in the country, the principle of which is founded on just and rational ideas ; namely, heating the atmosphere of the pit, by admitting the heat of dung linings to enter it without passing through the body of mould in which the roots are growing. Steam is precluded, as the heat has to find its way into the bed by passing through the tiles or bricks which form the sides of the pit. M'Phail's pits, already noticed, are in principle somewhat similar, but are much more expensive in the first erection, and always require a greater quantity of dung to keep up the necessary temperature. A sufficient degree of steam may be produced at any time in these pits by sprinkling water on the heated brick-work ; and still farther to defend the plants from the danger of damping, the shoots are trained to a trellis near the glass, which trellis may be so constructed as to be elevated close to the glass in fine weather, or let down from it when it is unfavorable.

SEPTEMBER.

NURSING PINE-PLANTS.

The directions recommended last month for the plants in this compartment, are applicable also to the present month, as long as the weather continues mild, and while the temperature remains as high as 70° or 72° during the night. On its falling below those points, recourse must be had to fire-heat; but this should be applied with caution at so early a period in the season. However, if the weather be cold and damp, slight fires will be necessary, not only to dry up the superabundant damp in the pit, but also to assist the temperature. The pine-plants of this age, in pits wrought with dung linings should be attended to, and the linings renewed as often as necessary to keep up a genial growing heat, so as not to check the growth of the plants, as they should be forwarded with all reasonable expedition at this time, for during the succeeding winter months they will not make much progress.

Air should be admitted accordingly as the state of the weather will permit. In fine warm days it should be freely admitted, and in close damp weather the plants will be liable to suffer, if kept long shut up from a free circulation, and be apt to damp and rot at their hearts. Where there are no fire-flues, the watering over-head should be gradually lessened, and only given in fine clear days, when the sun is sufficiently powerful to dry up the superfluous damp; but where there are fire-flues, it should be still continued, as by their assistance no danger can accrue to the plants, and the steam produced from the spilt water after the fires are lighted, will be very congenial to the plants, while, at the same time, it will be noxious to their insect enemies. The pits or frames, in which the young pine-plants still remain, should, towards the end of the month, be regularly covered every night with mats, or Dutch reeds, or canvas coverings, increasing the covering as the nights get colder, taking every possible care to fold up the ends of the mats, that they may not conduct the steam of

the linings into the frames or pits in too large a quantity. Those plants which are still not rooted, either in or out of pots, should only be slightly supplied with water, as it is necessary now to withhold that element gradually. Those which are well rooted, and in pots, should have water once in three or four days, as they may require. It should still be given frequently, but less in quantity as the winter approaches.

SUCCESSION PINE-PLANTS.

The directions already laid down for the plants in the nursing-pit, are applicable also to the plants in this stage of growth. The temperature, however, here must be kept as near as possible to 65°. The times of regulation being still at six o'clock in the morning and eight at night. The temperature throughout the day may with sun-heat be allowed to rise to 70° or 72°, but not above that point. The plants must be supplied with a moderate watering once in three or four days, but that element should not now be given in such a quantity as during the former months.

Air should be freely admitted every fine day; and when the weather is less favorable, it should be given in proportion to the state of the temperature of the pit.

FRUITING PINE-PLANTS.

The plants shifted and regulated last month, will now be growing fast, they therefore should be encouraged by every possible means. A mild, genial, though not burning heat, should be kept at their roots, and the plants liberally supplied with water. Liquid manure should also be applied, which should be continued once every week or ten days during their growing season; that is, from the time that they begin to grow vigorously until the fruit be half-grown, after which time it should be discontinued, as tending to injure the flavor of the fruit. Clear water then only should be given, and that reduced in quantity as the fruit attains maturity, as has already been noticed. The application of manure, in a liquid state, is the most convenient mode of enriching the mould in the pots after the plants have been finally potted.

In giving water to the roots of the pines, the middle of the day should always be chosen, at least from September till May; the intervening months being warm, the watering may be performed either in the mornings or evenings. At all times, when the plants are watered at their roots, the water should be applied through a tube, having a funnel at the end, into which the water is poured, and made into several pieces, to be shortened or lengthened at pleasure; the lower end, or that next the plants, should be bent downwards, and perforated with many holes for the water to pass through. By using this tube, the plants can then be conveniently watered from the outside of the pits, without injuring them, or wetting the bed too much. The plants should also be watered over-head once a week with the syringe, and the steaming resumed, by pouring water on the flues and floor of the house, while the flues are sufficiently heated to produce that fine moist exhalation so necessary to the growth of the pine and so destructive to insects.

Many cultivators of the pine water them during summer, and some few during winter also, over-head with a rose watering-pot; this practice hastens the decay of the tan, or whatever other matter the bed may be composed of; and as all plants in the same bed do not require the same quantity of water at all times, we would recommend giving the general waterings at the roots, as above, and the occasional waterings over-head with the syringe; this practice will consume a little more time, but each plant will then be supplied according to its wants.

The temperature, at the times of regulation, should be kept to from 65° to 70° , allowing an advance of 5° or 8° in the middle of each day from sun-heat.

As the winter approaches, care ought to be paid that no water be allowed to remain in the hearts of the plants, either from the watering-pots or from defects in the glass; when such cases occur, the water should be drawn up with a tin tube, or if it be only in a small quantity, it will pass off by evaporation, if the house be shut close up, and a brisk heat thrown into it by the flues. During the summer, pines will sustain no injury from this cause; but from this time until

May, a superabundance of water, either at their roots or lodged in their hearts, will be very injurious to them.

MELONS FOR LATE CROPS IN PITS HEATED BY FIRE-HEAT.

The plants planted out in July will now have spread over the pits, and will be considerably advanced in fruit. If the weather be dull or wet, it will be necessary at the beginning, if not at the middle of this month, to apply a slight fire-heat, in order to forward the fruit, and more especially to dry up dampness to which these plants at this season are extremely liable, and which is to them of that injurious nature, that if not guarded against and repelled, will entirely destroy not only the fruit but the plants also.

The temperature in the pits, however, should be kept very moderate at first, and gradually increased as the cold and the season advance. If the temperature be kept during night at 70° , and allowed to rise with sunshine to 80° , there will be a chance of having tolerably handsome, but not well-flavored fruit: the season for imparting flavor being over by the time this fruit will be ripening. Water should be very sparingly applied either to their roots or over their leaves; once in eight or ten days will be sufficient, unless the temperature be kept higher, which, in that case, they will require water more frequently for the welfare of the plants, and to guard against the red spider, which in such pits are apt to make their appearance even at this late period of the season.

The operation of pruning must be attended to, and no more vines allowed to remain on the plants than may be sufficient to nourish the fruit; all dead or decaying leaves should be carefully removed, and all appearance of damp or mouldiness removed. The fruit should be fully exposed to the sun by laying the leaves aside, which may overshadow them; or, if they be carefully lifted up on an inverted flower-pot, or any such article, to within a few inches of the glass, they will enjoy a greater share of its influence. Should the red spider make its appearance, it will be much safer at this season to expel it by sprinkling a little flour of sulphur upon the flues when heated, or by dusting it finely over the infected leaves, than by a too abundant application of water.

OCTOBER.

GENERAL MANAGEMENT OF PINE-PLANTS.

During this month, the same treatment as directed for the former month should be continued. The temperature, however, of each division, should now be reduced gradually a few degrees, say two or three; that is, from 70° or 72° to 69° or 68° . Artificial heat is not to be now applied to excite the plants to grow in the herb, that is, to increase in size, but merely to prevent any check to the roots from cold or damp.

On the approach of cold nights and dull foggy weather at the beginning of the month, fires will be wanted in the fruiting-pit, and probably also in the others; but by the middle or the end of the month they will be indispensable in all the compartments where fire-heat is used. Those pits which have not the convenience of flues will now require strict attention to keep up a sufficient temperature, but great care must be taken not to exceed the necessary degree, for much more caution is necessary in the management of pits heated by dung or leaves in a state of fermentation, than in the compartments heated by means of fire-heat; the former being subject to many changes from the state of the atmosphere and that of the materials with which they are composed, over which the cultivator has little controul. The fires can be lighted or put out in a short time, and thus a temperature can be sustained almost to a single degree for a length of time; whereas, if any material alteration take place in the beds of fermentable matter, either by their falling or rising to too low or too high a temperature, they are not so soon to be rectified. Nothing but attention and observation, and a frequent examination of the watch-sticks in the beds, and guarding the linings against the effects of too much cold, rain, or wind, can guard the cultivator at this season against sudden changes in these compartments.

Air must be admitted as the state of the weather will permit, and should now particularly (as well as at all other times)

be admitted in a regular manner, so that every part of the house or pit may derive an equal benefit from it. A constant circulation of pure air is always necessary to plants confined in an artificial atmosphere, whether they be growing fast or remaining almost stationary, excepting on particular occasions when it is less necessary, as when the plants are forming roots or immediately after shifting, when they are to be kept more close and shaded.

Water should now also be gradually diminished, as well at the roots as over their heads. It is, however, better to give it rather frequently, but gradually in a less quantity, and some of the plants will probably not require any for some length of time. This must be left to the good judgment of the operator, who should examine the pots frequently. It is better that the plants be kept now rather dry than too damp.

VINERY FORCED EARLY THIS SEASON.

The vinery forced early this season, will by this time have its wood sufficiently ripened to admit of the operation of pruning being performed, preparatory to its being put in order for forcing early next year. As soon, therefore, as the leaves fall, or are falling, the wood may be then considered as fully ripened, and this will be the case towards the middle, if not towards the end of the month. The advantages of early pruning, that is, pruning some considerable time previously to the plants being again set in motion, are too obvious to require any comment, more particularly with those which are intended for hard forcing. Plants become habituated, by certain treatments, to change their natural seasons of coming into vegetation, either in respect to their being forwarded or retarded. Thus this vinery, which was begun to be forced in February, may the year following be forced with safety in January, if required. In order, then, to prepare them for thus early coming into vegetation, it is necessary to prune them at or about this time, for, by so doing, the wounds will be completely healed, and no danger arise from bleeding, which would be extremely detrimental to their springing vigorously; and when once begun to bleed, it is not readily

stopped, to which all vines are liable that are not pruned until they be on the point of being put into a vegetating state.

Great has been the difference of opinion regarding the manner in which vines ought to be pruned; and every one who has either written or practised, as a matter of course, lays much stress upon his own mode. We have already observed, that neither the training nor pruning of this tree is of that material consequence to the production of superior crops as some other circumstances, which are connected chiefly with the food with which it is fed, whether from the border in which they are planted and supplied by the roots, or from the atmosphere in which they breathe and are fed by the leaves. If these two points be properly managed, the vine will be found to produce abundant crops under a variety of modes of pruning and training, as every person of observation must have repeatedly witnessed, not only in the vineries in this country, but also in the vineyards on the continent. To have a sufficient supply of proper bearing wood, is the object aimed at by every vine cultivator, and that mode which is adapted to produce this effect is certainly the best.

Some are advocates for long pruning, that is, laying in shoots of great length, while others are satisfied with the short shoots or spurs produced near the older branches, and the whole length of which seldom exceeds a few joints; others probably with greater judgment, adopt a sort of intermediate mode of pruning, by not only retaining some shoots of considerable length, but also a number of short ones, as well as some of the spurs.

The vine is a plant of so accommodating a disposition, that it is capable of being trained almost in any way that the fancy may suggest. The mode of training them directly up the roof, if planted in front of the house, or directly up the trellis, to which they are to be attached, if planted against the back wall, is one as convenient and rational as can be adopted. Therefore, in proceeding to give them their principal or winter pruning at this time, some observation is necessary, so that enough of bearing-wood may be retained, and no more; and that a reasonable portion of the old be removed, not only to make room for succeeding young wood, but to induce a dis-

position of always keeping the vines, as it were young, by never allowing any old wood to remain that can be cut out, unless it be those which are well provided with younger branches, and convey, as it were, their younger shoots towards the more remote parts of the space to be so covered. All old wood that can be thus spared should be first removed, even some of such shoots as may be of several years' growth, and that have acquired a considerable diameter towards the root; such of these as are not well supplied with young bearing-wood, better than any that may be contiguous to them, should be entirely removed from the very bottom. Such shoots as were laid in during summer, and which will have attained a considerable length, should be shortened more or less as the regular distribution of young wood may require; and such of the smaller and short shoots that have been stopped, and treated like spurs, should be shortened into one, two, three, or four eyes, according to their several strengths, and more or less of them removed according as the space may or may not be filled sufficiently with young wood. This shortening in of all the shoots in the house depends much less upon any specified length than upon the regular distribution of young wood throughout the whole; the stronger and well-formed shoots should, however, always be preferred to those which are less strong; therefore, the principal supply of bearing-wood is thus to be selected from the shoots trained in and reserved for this purpose during summer, and the smaller spur-like shoots to be resorted to as substitutes where there may be a deficiency of the former, as the finest fruit, in regard to size, &c., will be produced from the stronger shoots; but grapes, in flavor equally good, will be the produce of such as are of a less luxuriant growth. It should always be a principal object in view in the training of every tree, to secure a sufficient stock of proper wood at the bottom, as all trees are naturally inclined to push stronger towards their extremity; this habit, however, must be counteracted by using the knife more freely towards these parts, and thus ensuring a plentiful supply of wood at those parts, which, if once suffered to become naked, cannot be so readily filled up again. In shortening the shoots, of whatever size, cut an inch or an inch and

half above the last eye, so as not to injure it, as it is likely to push the strongest of any of them; and always make the cuts in a sloping direction, so that no moisture may be induced to lodge in the spongy pith of the wood: this precaution should also be attended to in amputations of larger branches, and the wounds smoothed over with a sharp knife.

The pruning being finished, some recommend to take off the loose outward bark with which the older branches are covered, which may readily be done by rubbing it between the hands, and all that becomes freely disengaged without using much force may be taken away, observing not to injure the smooth bark; and, for greater caution, always make use of the hand, but never the knife only. This removal of the outer bark will be of advantage to the vines, but we would prefer delaying the operation of removing it till shortly before the plants are to be put into a state of vegetation. Clear the trellis and branches of all decayed leaves, pieces of old matting with which the vines have been formerly tied up, and also all tendrils. Then carefully wash the stronger branches of the vines, the trellis, and all the wood-work of the house, with clean water. This being done, anoint the vines and trellis with a wash prepared in the following manner:—Slice down two pounds of soap, but if soft soap can be procured it will be better, of which take two pounds; two pounds of tobacco, or three of tobacco-paper, such as is used in the manufacturing of tobacco, and which contains a large portion of the oil expressed in the process. Put these into a tub, and pour over them as much water as will, when the soap is beaten up into a lather, have a pretty thick consistency, so as not to run off the trees when applied. When these are well beaten up, and all the soap dissolved, add two pounds of flour of sulphur previously worked up separately to the consistence of thick paint; when this is added, the whole should be well stirred, and applied to the shoots of the vines and trellis by means of a sponge, allowing as much as possible to remain upon the branches. This will destroy any insects that may be alive or may be harbouring under the bark of the vines, or at least it will be the means of preventing the return of them when the trees are put into active vegetation. This cleaning should be again

performed in the two following months, as from the nature of the season, particularly if the glass be off, the ingredients will be liable to be washed off by heavy rains, &c.

The shoots and branches should be now regularly laid in and properly tied to the trellis, dividing the whole as regularly over the space as possible, and placing them at regular distances from each other; and should it appear that any shoot is ill-placed, or too many left, they can be now removed or shortened, more particularly the young shoots, so that when they come to break into wood, they may not be too thick and crowded. In regard to the naked stems, some of which will still remain on the vines as conductors of the young wood to the remote parts of the trellis, it matters not how close they are placed together, as from them no shoots are to be allowed to issue; and where it is necessary, some of the young shoots may be trained upon them, which will hide their more naked appearance. The matting chosen for tying up the vines should be new and fresh, as it will in some cases have a considerable weight to sustain; and, in tying them up, care must be taken to allow plenty of room for their future swelling.

The borders of the house may be slightly dug over, which will give a neater appearance to them, until they be again put into a state for forcing; and, if it be deemed necessary, the borders, both inside and outside of the house, may be mulched over with a coating of good half-rotten dung.

By the beginning of this month, the vines in pine-stoves, if any be planted on the outside of the house, and trained up the inside rafters, as is the usual mode, should now be taken out of the house and trained to the front outside, or to stakes placed for this purpose in the ground, where they should remain till the end of December, or till such time as it may be thought proper to take them in again. This has been our practice for several years, but many excellent cultivators do not take them out at all, and we find this was the practice of M^r Phail, and is also the practice of Mr. Shepherd, of Sunbury, a commercial cultivator, and of many other successful vine-growers of the present day.

Amongst the various modes of training the vine in vinerias,

we will select the following methods, as being applicable for the generality of purposes:—

The mode of Nicol, which he recommended in his works, and which he long successfully practised, is as follows: If the vines be trained up the roof, “there should be three ranges of bearing shoots; viz. one range at the bottom of the trellis, from end to end of the house, reaching from within two feet of the ground to five or six feet upwards; a second reaching from a foot, or perhaps two feet under the tops of these, that is, from within seven or eight feet of the ground to the distance of fourteen or fifteen feet upwards from it; and a third range, reaching from a foot or two under the tops of these last to the uppermost row of wires on the trellis; the shoots of the first or lower range being headed at about five or six feet; those of the second or middle range about seven or eight, and those of the third or uppermost at about nine or ten feet in length; all a foot or two more or less according to their strengths, or to the height or lowness on the plants from which they have issued, and to the extent to which they have sprung, and the maturity they have acquired. The distance at which these shoots should be placed from each other in their respective ranges is about thirty inches, which distance is necessary to give room to the stubs of next year, on which the clusters are to hang, as in this season; and which distance may be varied a few inches, according to the kind of grapes, some growing stronger than others.

“The undermost shoots on the trellis, or those placed nearest to the ground, and which were only trained to the height of a few feet, must be shortened back to two or three joints: it being a principal point in the training of vines always to provide for a supply of bottom-wood, and to keep young wood as near to the ground, or lower parts of the plants, as possible.”

Speechly recommended and adopted in the Welbeck gardens the Dutch mode of training, which consisted of perpendicular shoots being induced to issue from two horizontal branches laid in near the ground, in the first or second year's growth of the plant. These perpendicular shoots were to be regularly

renewed every fourth year, and from them spurs issued, which produced the crop, as well as some few shoots laid in with them. During the first three years of this mode of training, few grapes were produced, and probably from that circumstance it has been almost universally laid aside.

Forsyth's method of training vines, which he recommended and adopted in the royal gardens at Kensington, was somewhat similar to the last; but, instead of laying in the shoots perpendicularly, he trained them in a serpentine form, from an idea of making them break more regularly.

M'Phail describes the fan manner of training vines, and which, he observes, has been long practised where there is extent of space. We feel inclined to justify this practice, as being that of all others the most likely to produce an equal distribution of young bearing-wood over the tree with the least trouble or confusion.

Hayward recommends planting only one vine in each house, and allowing it to fill the whole space intended to be covered; founding his theory very justly on the well-known fact, that the greater the distance which the sap has to flow through the vine, the more abundant and high-flavored will the fruit be. He proposes training either in the horizontal manner, from two leading shoots, or in the wavy horizontal manner: he appears to give the preference to the latter plan. The only objection to filling one house entirely with one kind of grape, is the want of variety. Those who have witnessed the abundant crops of fine-flavored grapes produced from the celebrated Hampton-Court vine; the large vine (said to have originated from a cutting of it) in the gardens at Cumberland Lodge, and many others of large size, will be convinced that vines in general have not sufficient roof allowed them, and that one plant will be amply sufficient for a large vinery.

The deputation of the Cal. Hort. Soc. in their Horticultural Tour, describe having seen vines in a garden at Ghent, which were planted outside of the house, and only their bearing branches taken in; the wood produced this year is trained to a trellis outside the house, and the following season is brought in to produce its fruit, while another set of wood is forming outside for the succeeding crops. Even at Ghent,

this method is not always found to succeed, in consequence of the young wood not becoming sufficiently ripened during autumn; consequently, in this country, little dependence can be placed upon it, from a similar cause.

J. Seton, Esq., in a communication to the London Hort. Soc., published in their Transactions, gives the following scientific method of training the vine, and which he has practised in his garden with success.

“The vine having, like other trees, a tendency to produce its most vigorous shoots at the extremities of the branches, and particularly so at those which are situated the highest, it generally happens, when it is trained, as is most frequently done, across and upwards, from the front to the back of the house, that the greater portion of the fruit is borne near the top, while the lower parts are comparatively barren. This takes place whether the branches be made to consist chiefly of vigorous terminal shoots, preserved at considerable length, or the leading shoots be kept short, and lateral spurs be left for the production of the fruit; but in the latter case the evil exists in a smaller degree: for the spurs, or short lateral branches, divert the sap in its ascent, producing, by means of its flowing to their extremities, an approximation to the effect of long branches. The same inconvenience would occur, to a certain extent, if the vines were trained in a like manner in the open air, but it is greatly augmented in a house, in consequence of the air being much hotter, as every one knows, at the top than below. Having observed that the fruit produced on the vigorous shoots, which usually grow at the extremities of the long branches, is generally more abundant, and of a finer quality, than that produced on the short lateral ones, I was desirous to promote the growth and preservation of the former; but the usual mode of training the branches across the house and upwards being subject to the objection above mentioned, and little scope being afforded for it in a house of small dimensions, I thought,” he says, “I should obviate these inconveniences in a great measure, and attain another object, presently to be mentioned, by training the branches in a horizontal direction, and keeping the whole of the fruit-bearing part of each tree nearly on the same level.”

With a view to reduce these ideas to practice, he planted five vines at the ends of a house twenty-five feet in length, which for this purpose was provided with rods placed horizontally under the glass of the roof, twenty inches asunder, and extending from end to end. The first vine, placed at one end, being trained up to the two lower rods, a shoot of it was laid along each of them, and continued successively from year to year till it reached the other end; then the shoot on the lower rod was turned upwards to the next, and led back upon it towards the stem of the tree, whilst that on the upper rod was turned down, and led back in like manner on the lower one. During this process, a sufficient number of spurs or short branches were left annually on the old wood to produce fruit. When the leading shoots, which had been thus trained in a retrograde direction, approached towards the end, whence the original branches proceeded, preparation was made for a succession of young wood, by bringing forward two fresh shoots from the stem of the tree, and leading them along close to the preceding ones. As these, and the leading shoots of the first branches, were then on their return advancing, the spurs on that part of the old wood to which they had reached were cut out to make room for them, the naked stem only being left. When the second series of branches had returned nearly to the end at which the trunk was situated, the first series, on which there was then but little of the herbage remaining, was cut out at the trunk. Fresh shoots were then brought forward to succeed the second series; and so on without end. It would be superfluous to dwell on the mode of managing the other trees, as it will be perceived that, on following the same principle, they must be laid along the higher rods in succession, two rods being allowed to each tree; and when the stem is not at the end of the house, two branches are to be trained eastward and two westward along the rod. This, in a house of twenty-five feet in length, instead of having only fifteen or sixteen feet to admit of the length of a branch, as would be the case under the usual mode of training across the house, we have a range of thirty feet, which affords ample scope for the long shoots at the extremities: and these I find, when laid in the horizontal

position, and left from three to five feet long, according to their strength, usually bear fruit at all their buds, while the spurs on the old wood are also very productive.

Griffin, a very successful cultivator of the vine, approves of planting outside the house, and introducing the shoot through a hole immediately under the rafters. He trains up one main branch under each rafter, and the fruit is produced from spurs, or side shoots, issuing from the sides of it. These spurs are cut in to one eye, or bud, at every winter pruning. In course of time, this main stem becomes ragged, and too full of spurs; when such is the case, it is wholly removed, having previously obtained a substitute for it from its lower parts, which is to replace the one taken away and managed in a similar manner. The leading shoot of this main stem is stopped during summer, leaving it three or four joints in length, and in the winter pruning, this is cut clean off, and also occasionally a portion of the end of the main stem, when the top of the house becomes too crowded. By this method great regularity may be attained; and as the fruit-bearing shoots extend only a short distance from the main stem, more light and sun-shine will of course reach the fruit, particularly if they be stopped at the first or second joint above the fruit, which is amply sufficient for drawing up nourishment to it. To allow the shoots in this case to attain any considerable length, can be of no real utility, as they will ultimately be pruned off at the winter or general pruning; while, during their growth, they only tend to exhaust a share of the strength of the vine, which will be diverted to the fruit when the practice of stopping them is adopted.

NOVEMBER.

NURSING PINE-PLANTS.

Winter will now be fast approaching, and an opportunity for making up the beds sufficiently strong to last till February or March, may not occur after the beginning or middle of this month. It is therefore necessary that every department of the pine-pits should be substantially made up to last till that time.

Make choice of fine weather, the benefit of which should never be lost, whenever a general arrangement is going on in these departments. Proceed to remove the plants as before directed, by having them carefully taken out of the bed, tied up, and such as may be in want of support from standing loose in the pots, supported with neat sticks. The plants will not now require a general shifting, neither do we think that a general shifting should ever take place, unless rendered necessary by some unforeseen event, which does not often occur; but the plants should be shifted as they may individually require it; thus they should be examined every time that they are taken out of the bed, for the purpose of having it renewed. Such only, therefore, as seem to be in want, should be shifted, and at this time it should be performed with care, so as not to injure the roots nor destroy the balls, unless they be hard, or the roots much matted or decayed; in such cases, the balls should be gently broken, the roots separated, and all decayed ones removed, and then repotted into pots corresponding to the size of the plants. If the roots be much injured at this season, there is little chance of their forming new ones till the spring; therefore, it is of little consequence whether the old decayed roots remain attached to them among the few good ones they may chance to have, and which may be able to support them till the spring, or whether they may be cut out; which, however, cannot be well done without in some degree injuring

the few healthy roots amongst them: such, therefore, as are in a very bad state in this respect should be shifted.

Any dead or injured leaves should be cut off, with the view of giving the plants an appearance of greater neatness and health. The bed should be thoroughly turned over to the bottom, and a large portion of the most reduced matter taken out to make room for a sufficient quantity of fresh prepared tan or leaves, to keep up a due temperature during winter. The tan or leaves now to be introduced, should have been previously prepared, by being fermented and turned over once or twice, in order that every part may have undergone a sufficient degree of fermentation, and be less liable to heat to an immoderate degree when put into the pits, as well as to continue to a greater length of time in a steady regular heat.

“It is a common practice,” Nicol very justly observes, “to add a large proportion of new bark or tan at this time, with the idea of keeping up a strong heat to resist the cold or winter, and some also keep up a high temperature throughout winter from the same mistaken idea, than which nothing can be more pernicious to the plants; hundreds of which are cast out in spring, after having cost much trouble and expense. If the season be dormant, so ought and so will be the plants, in despite of all our exertions to the contrary. It is, therefore, a vain and futile striving; a striving against the stream, to force or indeed to attempt to force them into activity, without the congenial help and assistance of that ‘life and soul of vegetation,’ the sun.”

Presuming that the flues have been cleaned and the house white-washed, as advised in the foregoing months, the plants should then be placed into the bed again in the same regular manner already directed, keeping the tallest behind and the smallest in front next to the glass. It may not be necessary to plunge them to their full depth till towards the end of the month, for fear of the heat in the bed becoming too powerful for their roots, which might be highly detrimental to them at this period, more so than at any other; for if they now lose their roots, or have them much injured, they will not be able to furnish themselves with others till the spring. Their remaining, therefore, all winter without roots, or with their

roots much injured, will be the greatest injury they possibly could sustain.

Towards the end of the month, therefore, when all danger of an over-heat has passed, they should be plunged up to the rims of their pots, taking care during the operation to set them level, so that they will contain water sufficient for their nourishment until they be again regulated. The tan or leaves should be kept clear of the surface of the mould in the pots, so that the same effect may be attained, as well as to enable the operator to determine whether they be or be not in want of water. When replaced in the bed, they should have a little water to settle the mould about their roots, and in a fine day be gently dewed over-head with the syringe, to clear them of any filth which they may have contracted during their removal and replunging. The water now used for this purpose, as well as for watering at their roots, should have the chill taken off previously to using, by mixing a sufficient quantity of hot water to the cold, to render it nearly equal to the atmosphere of the house.

The temperature should now experience a further reduction of from 70° or 68° , to 64° or 66° , at which it should be kept during the winter. Attend to mat or otherwise cover up such as remain in frames or pits heated by dung-heat, in order to be able to keep up a temperature equal to the above degree. In plunging the plants into their winter habitations, they may be placed much closer together than they have hitherto been, as being the means of getting in as many plants as possible, with the view of lessening the necessity of so many different compartments.

Continue to admit fresh air as freely as the state of the weather and the heat in the pits will admit of. It is better that the pits should be under their regular temperature for a few hours, than that the stagnated air should be too long confined, observing to shut up early enough in the afternoon so as to admit of the heat of the sun; raising the temperature sufficiently before the pits are covered up. The waterings must now be gradually lessened in quantity, and once every six or eight days will be found sufficient, observing now to give the necessary waterings in the forenoon of the finest days until the return of spring. The syringing over top should

also be given at the same time, and only in a moderate quantity; but in proportion as this is decreased, recourse must be had to the production of steam from the flues, by pouring water upon them as before directed. But in the frames or pits worked by linings of hot dung, it will not be necessary, as there will always be a sufficient moisture arising from the bed to answer every purpose required.

SUCCESSIONAL PINE-PLANTS.

The successional pits will now require also to have their beds turned over from the bottom, observing the directions already given for the nursing-pits. The plants here should also be carefully examined, and all those shifted which appear in want of it; taking care to break their balls as little as possible, unless they be so hard and matted as to indicate a state of absolute want of room. The plants which are the most forward in growth should be shifted into pots of a larger size, in order to give them a chance of making roots or of continuing in growth, if they be so disposed. The temperature by fire-heat, which will now have become necessary, should be kept up to as near 60° as possible, allowing a rise of 5° , that is, to 65° in sun-shine; it should not be permitted to reach a higher degree, but be kept down to that point by means of the admission of fresh air. As the cold weather approaches, the waterings should also be less frequent, and much less in quantity. The syringing should also be more moderately applied, and the humidity of the compartment kept up by means of steam, produced by pouring water on the flues while they are sufficiently warm. Air should be regularly and freely admitted while the weather continues open and fine; but should it continue for many days damp or cloudy, give air regularly over the pits, and keep up the temperature by means of slight fires, even during the day.

FRUITING-PIT.

The foregoing directions are applicable to the plants in this compartment. The bed will require to be carefully turned

over, a large portion of the exhausted matter removed, and a supply of fresh matter brought in to replace it, which has been prepared as directed for the nursing-pits. The plants that require shifting should now undergo that operation, and when replaced in the bed, should be plunged only half or three parts, until the heat of the bed may have been positively ascertained not to be too strong for the roots. Towards the end of the month, the heat will have sufficiently subsided to admit of their being plunged to the rims of the pots. The same precautions must be used to keep the surface of the pots clear of the tan or leaves, for the purpose of allowing their being watered with ease, according to their several necessities. Any dead or decayed leaves should be removed by cutting them off; but at this time avoid taking off any from the bottom of the stem, as their remaining on will prevent the emission of roots from that part till their shifting in spring, when it will be of more service to them. Give a slight watering after plunging, both at the roots and over-head, observing now to take the chill off the water as already directed. They should also be syringed over-head, but only sufficiently to clear them of dust. Water must be now given in a much less quantity each time, giving a little and often, taking care to spill as little as possible on the bed, which would have a tendency to produce a too rapid decay, and consequently a decline of heat before the season will be sufficiently favorable for its renewal. The steaming should be attended to, accordingly as the system of watering is less persisted in. The temperature should be kept as steady as possible at the point recommended for the succession-pit. Air should be admitted as circumstances will admit of, but rather raise the temperature by slight fires throughout the day, than allow the stagnated air to remain too long unchanged in the house.

PEACH-HOUSE.

At this time, the peach-house to be forced next season should be pruned and put in order, for the same course of treatment which has been followed during the past season. (For full directions, see *January*.)

VINERY.

If the operation of pruning and dressing the vinery were not done last month, it should now be proceeded in without delay, observing the rules therein laid down.

CHERRY-HOUSE.

Towards the middle of this month, it will be well to examine the state of the trees in this house, whether they be planted out entirely, or whether they be in large pots or boxes. Those which are in pots or boxes that appear sickly, weak, or that have not a sufficient number of flower-buds upon them, should be taken out and placed with the stock of those trees in preparation, to be from time to time taken into the house. To make up for such trees as may seem worn out, or unfit for present use, take in an equal or sufficient number of fresh trees. (See *January*.) Carefully examine the whole, and let them be now pruned according to their several necessities, that they may be in readiness for forcing again early in the ensuing year. Cherry-trees having been once forced, seldom after require much pruning, as they do not often make much wood under glass; all that may be necessary will probably be to regulate and thin their spurs, when too much crowded, and to cut out the superfluous, and all such as appear weak, or are dead; any breast-wood that may have been made since the crop was gathered, should now be displaced.

The leading shoots, and those in the lower parts of the trees, need not be shortened, except for the purpose of inducing wood to fill up any blank or vacancy. But if it be necessary to shorten them, let them be cut pretty well in, as otherwise they will push very weak shoots at the extreme parts of the trees, and those that require shortening for the above purpose, need not, however, be cut so closely in. If they be headed back one-third or to half their lengths, it will be found sufficient. Such trees as are brought in for the first time, will require to have their shoots shortened in proportion to their strength; for, if left at their whole length, they will

break weak, and if too many buds be left on, many of them will be shed at breaking.

When all the trees have received their necessary pruning, let them be carefully washed all over with the preparation recommended in the *Fruit Garden*, taking care not to rub off any of the buds in the process. When they are all washed, let them be arranged according to their respective heights: the tallest next the back, and the dwarf ones in front. The whole house should be cleaned thoroughly out, the flues cleaned, and all made ready for commencing forcing, either in the subsequent months of January, February, or March.

It is to be observed, that the same directions are also applicable to apricots and plums

FORCING SEA-KALE AND ASPARAGUS.

These two esteemed vegetables should now be put in preparation for forcing, so that their produce may be fit for the table at a season when few of the delicacies of the garden are to be procured. These vegetables, from their habits of growth, are extremely well calculated for early forcing; the former being much improved by that process. (For directions, see *January*.)

D E C E M B E R.

GENERAL MANAGEMENT OF PINE-PLANTS.

The rules laid down last month respecting the different compartments of the pines, should, during the present one, be duly attended to. A steady temperature now is necessary, as well as attention to the proper supplies of water and air; the former of which should be given as necessity may require, but not to an excess at this season, when the plants are almost in a dormant state. Air, however, should be admitted on all favorable occasions.

Such of the pits as are wrought by dung-heat, should be carefully attended to, in order that their linings be sufficiently powerful to keep up the necessary temperature within the pits, and that they should be regularly covered up every night, carefully disposing of the ends of the mats, so as not to be left hanging over the linings, which would be apt to confine the too powerful steam within to the injury of the plants, as well as preventing the free escape of the steam from the external linings, and conveying it into the pits. Avoid covering up too soon in the afternoon, unless the heat in the pits be rather low, and take the covering off every morning by sunrise, in order that the plants may enjoy as much light as possible. When snow is falling, or has fallen throughout the preceding night, it should be carefully swept off as it falls; for if the plants be long excluded from the light and permitted to remain long covered with snow, they will consequently suffer according to the length of time in which they are so precluded from the light of the sun. It is indeed true, that in countries such as Russia, the pine-pits and houses are often covered for weeks during winter, when the thermometer is 20° below zero, with mats and even boards to prevent the weight of snow which has fallen upon them from breaking in the roof-glass, and the plants are after all brought to pretty good perfection; but as we live in a more temperate climate,

where we need seldom leave them covered up for more than twenty-four hours at most, we should, therefore, use no less diligence to prevent this comparatively trifling exclusion, and render it of as short and less frequent occurrence as possible.

PEACH-HOUSE.

It may be necessary to remark, that if the peach-house were forced early during the past season, the buds will be much swelled, and be liable to be injured by very severe frosts; therefore, to guard against such an accident, the lights may be put on, but it must be strictly observed that they be drawn down every day, in order to keep the buds from swelling too rapidly. Unless the weather be very severe, they should be even left off all night; the only motive for their being placed on now is to secure the buds from injury from intense frosts.

VINERY.

If it be intended to commence forcing vines in January, the directions laid down in that month respecting the vinery being put into preparation for beginning in February should be observed; but if it be intended not to begin till February, the house must remain in the state in which we left it in October, observing to have the vines and trellis again washed with the preparation there noticed.

It is seldom that the shoots or buds of vines are injured by cold, provided the wood has been properly ripened in autumn; the glasses may, therefore, be with safety left off till a short time previously to their being put into a state of vegetation; and where, from the construction of the houses, the sashes are fixed, air should be admitted as freely as possible to the vines both day and night.

We have noticed already, that opinions are at variance whether the vines should be uncovered or not; in our practice we have often left them covered, and very often filled them with the hardier green-house plants for protection during winter, and as often had them uncovered, without any sensible advantage or disadvantage attending the succeeding crops.

ON THE FORMATION OF HOT-HOUSE BORDERS AND
PLANTING THE TREES

IN the preceding twelve months we have conducted the young horticulturist through a series of management applicable to the forcing of peaches and vines, which, if acted upon in fully established houses, where the trees and vines have been planted for some years, and which are supposed to have been in a healthy full-bearing state when we took up the subject in January, will, it is presumed, be attended with success. But, as it not unfrequently happens that additions are made to the extent of forcing-houses, as well as considering that all houses must have been once planted, we will take up the subject in another form, and suppose that the houses are finished, and the planting to commence during winter or the ensuing spring.

To prevent unnecessary repetition, we will suppose the houses are intended to be furnished with borders inside and out, and that the trees are to be planted within the house, waving all comments on the structure of the building, which has already been treated of, and confining our views alone to the general culture of the trees

PEACH-HOUSE.

The bottom of the peach-house is supposed to be rendered perfectly dry by being properly drained, and the mould entirely excavated to the depth of thirty inches, or three feet, and that the floor has been made impenetrable to the roots gaining a greater depth. Having, in the former part of this work, advised the collecting of various loams and moulds to be always in readiness, and kept in a state of preparation in the compost yard, we proceed to direct, that such as we have already recommended for the peach-tree borders in the Fruit Garden, are what should be also chosen wherewith to fill up the new forming peach-house borders. As soon as the borders are in a fit state to be formed, which may be any time

during winter, when the frost is not too severe, (or if they have been formed in autumn so much the better,) proceed by bringing in the prepared mould, and filling up the excavated space, observing that it must not be attempted if the weather be by any means wet; the mould will be dry, having, as we have before directed, been laid up in ridges, so that the wet could pass freely off after each turning. In filling up the borders, the mould should not be much trodden upon, but allowed to sink of its own accord, an allowance being made for it, by filling the borders up a foot higher than they are ultimately intended to be.

Upon the supposition that the flues and parapet or front wall stand upon pillars, in order that the roots by that means may pass freely out of the house, care must be taken, in filling up the borders, to have all these spaces between the pillars properly filled up with the prepared mould, accordingly as the process of filling the border proceeds. If this be not duly attended to, the mould will naturally sink, and thus a space be formed, which will prevent the roots from gaining the outside borders, being in itself a very serious misfortune, and the cause will not be perceptible until the trees have sustained a material check. If the mould brought in be in a fit state wherewith to fill the border, as far as regards moisture, it will not be amiss to push it in rather firm in such cavities, with the view afterwards of obviating all pressure on that part of the border, and thereby preventing any injury to the roots; but after the house has been finished, and during the three or four subsequent months, these spaces should be examined, and filled up where they sink. The borders being finished, both without and within, and the glasses on, the whole may then be supposed to be ready for planting.

It is a matter of much importance to the future success of the trees, that they be well chosen, and it is of still greater importance to the proprietor, that the selection be well formed, which, however, is no easy task. The many mistakes made by some nurserymen, in sending out trees under wrong names, occur so frequently, that if twelve trees be planted, three or four out of the number prove incorrect; and this is not, nor can be, detected until too late, when the trees are established

and in a full-bearing state. The only alternative then is to grub them up and substitute others, or to bud them with such sorts as may be more desirable. This is not only a disappointment in the loss of the fruit, but those trees which are thus a second time planted, are long (if ever) before they overtake the others; and during the whole of this time, the house has a patched appearance. The kinds being determined on, (see *our lists*,) the next thing to be considered, is the choice of the trees. Some prefer older and some younger trees; but those of two years training, if they have been well grown, be very healthy, not over strong nor luxuriant, and free from disease and insects, as far as can be ascertained, are to be preferred. If it has been anticipated that such would be wanted, it would be an advantage if the trees had been purchased the year preceding, and planted in any favorable aspect, and in a bed of prepared mould, or planted in large boxes, which could be easily taken to pieces, and plunged in the border till wanted. Their removal at this time would be attended with no risk of their sustaining injury, and there they could be trained to answer the situations in which each might be placed when finally planted. Some gardeners will not plant the trees in their houses until they have seen them in fruit. This is acting with certainty as to the kinds of fruits wished for; however, trees of that age cannot be safely transferred from a distance without sustaining some injury, and indeed they can only be safely used for the planting of a peach-house, when they have been grown for a year or two on the walls of the garden, where they are to be afterwards used for planting a house in the same garden. Such trees will be less liable to run into luxuriance of growth, and will therefore come into a bearing state sooner than those which have been planted younger.

In whatever way the trees are to be planted, that is, either as standards planted in the borders in the middle of the house, or trained to the roof, back wall, or in any other way, it is advisable to plant out the trees that are to be considered as permanent at regular distances from each other; which distances should be determined on in proportion to the length, width, and height of the house. Between such trees should

be planted others of a greater age, to come into bearing sooner, say the year following the planting, and to be cut out by degrees as the others advance which are intended to be permanent. Such trees are denominated standards, or riders, and are generally on stems of considerable height, so as to fill the top part of the house, while the dwarfs or permanent ones are filling up from the bottom. Those trees which are planted for temporary crops, should not be less than three or four years trained; and if even of a greater age, if healthy, and having the appearance of plenty of blossom, so much the better, as it is desirable to have them produce fruit as soon as possible; and if the dwarfs thrive, they will require to be removed in three or four years entirely, if intended to be replanted. But it most generally happens that they are allowed to remain, particularly in large houses, until they be cut out by degrees, to make way for the permanent trees as they advance and occupy the space.

The planting should be carefully performed, the roots well singled or separated out, and the pits of a proportionable size for the roots; after planting, they should be moderately watered at their roots, and slightly fastened to the wall or trellis to prevent their being broken. They should not be shortened nor headed down until the end of March or the beginning of April, at which time they will begin to vegetate, and should then be headed in, in the following manner:—The dwarfs, or permanent trees, should have “the shoots on the lower branches cut back to two or three buds, that the wall or trellis may be furnished from the bottom with young wood. The uppermost shoots may be shortened back to half or one-third of their lengths, according to their strength, provided they have been well ripened, and are free from mildew or canker; but if they be anywise diseased or injured, let them be cut so far back as to get rid of the cankered, injured, or diseased parts.”

“The riders, or standards, need not be headed nor cut in much; the object being rather to throw them into a bearing state than to cause them to push into strong wood, which would not be so fruitful.”

If they have been well ripened, and the shoots moderately strong, a light crop may be expected of them the first year, and a full crop the second after planting.

As the shoots of the permanent trees or dwarfs advance, let them be carefully laid in, and fixed to the wall or trellis, about nine inches apart, and kept carefully free of insects throughout the season.

The shoots of the standards or riders may be laid in closer, and of course in greater number, it not being intended that they should grow so vigorously as those of the permanent trees or dwarfs. In all other respects, their summer pruning, training, &c., is the same as has been already laid down for peach-trees fully established.

During the whole season, the newly-planted trees should be freely supplied with water at their roots, and their branches and leaves should be regularly washed with the syringe or garden engine, to keep the leaves clear of dust, as well as to refresh them and suppress the red spider. This watering over-head should be applied with considerable force every two or three days. Upon the appearance of the green fly, recourse must be had to fumigations of tobacco until the enemy be subdued.

It is of the utmost importance to the welfare of the trees that air be regularly and freely admitted to them during the early part of the summer, and after the middle of June, the house should be thrown open day and night; shutting it up, however, during heavy or continued rains, which, if not attended to, would too much saturate the borders about the roots.

These points being attended to, the trees will be in condition for gentle forcing the subsequent year, and will be in excellent order for regular forcing the third year, which forcing may, if desired, commence by the latter end of January or the first of February.

Should the season chance to be cold, backward, or wet, it may be necessary by the middle of September to shut up the newly-planted peach-house, in order to facilitate the ripening of the wood to the extremities of the branches, and a little fire-heat

during cold damp weather, may also be necessary, still farther to assist that necessary point. As soon as all the shoots of the smaller and middle size become of a brownish color at their lower parts, and the fruit-buds upon them appear full and easily distinguished from the wood-buds, fire-heat may be then discontinued. The stronger shoots of the permanent or dwarf trees will continue to grow later than those of the standard or rider trees; but as such are to be considerably shortened back in autumn, in order to cause them to push wood to fill the wall or trellis, their being ripened to their extremities is matter of much less consequence, provided that they are properly ripened or hardened at their base. When fire-heat is discontinued, and the shoots ripened properly, the trees should be exposed to the full changes of the weather as much as possible, only guarding them against too much cold rain, which is always injurious to the peach-tree. In November they should be pruned, and otherwise put in order, preparatory to their being forced the following spring. (For directions as to pruning and training, see the *Established Peach-House*, already taken notice of.)

During the summer months after planting, the borders of the peach-house should be mulched, that is, covered with littery dung, or indeed any similar matter capable of preventing the drought from penetrating to the roots of the trees; this is of much use, and is too often neglected, not only in this case, but also in regard to all fruit-trees, planted either on the walls or even as standards. It lessens the labour of watering, and, by preventing too rapid evaporation, keeps the mould round their roots at nearly the same degree of moisture.

VINERY.

The preparation of the new borders of the vinery should be proceeded with, when the weather is dry and not frosty, (provided that they have not been formed in autumn,) as they should all be got ready by spring for the final planting of the young vine-plants. The season of planting vines extends

from Autumn till March, and often later. Vines planted in May and June have succeeded to the fullest expectation; however, where circumstances will admit, any time from January till March may be considered a good season. The borders, both within and without the house, should be prepared by being, in the first place, rendered perfectly dry by draining or otherwise, and this should be done in a substantial manner; for after they are formed, and the vines planted, it cannot be so effectually done, and it is of the utmost consequence to the future welfare of the vines, that they should be placed on a dry bottom. Their roots naturally extend to a great distance in quest of nourishment, and are therefore apt to penetrate beyond the limits of borders, which are too scantily formed for them, either in depth or breadth. When they extend beyond the limits of prepared borders, if the soil be naturally cold and damp, the fruit will not be of fine flavor, and, consequently, many of the berries will shrivel, assume a sickly color, and ripen prematurely, and be not only destitute of flavor, but actually sour. The foundation of the borders should be well drained, and a floor constructed on the same principle as has been recommended for fruit-tree borders, so that the roots cannot penetrate it. Over this floor, a thick stratum of lime-rubbish, or similar matter should be laid, over which the border should be formed of light rich loam, well ameliorated by frequent turning over and exposure to the atmosphere; to this loam, however rich in itself, a moderate quantity of well-decomposed dung should be added, and the whole brought to a sufficient degree of lightness by the addition of well-prepared vegetable mould, to which may be added a portion of lime-rubbish, broken bones, shells, or similar matter.

In the formation of vine-borders, horticultural writers have fully given their various opinions, and the following preparations have been recommended by men eminently successful in the culture of the grape. Speechly, in the formation of the borders in the Welbeck Gardens appropriated for vines, adopted the following method:—“ One-fourth part of garden-mould, (a strong loam,) one-fourth of the sward of turf from

pasture where the soil is a sandy loam, one-fourth of the sweepings and scrapings of pavements and hard roads, one-eighth of rotten cow and stable-yard dung mixed, and one-eighth of vegetable mould from reduced and decayed oak-leaves. The sward should be laid on a heap till the grass-roots are in a state of decay, and then turned over and broken with a spade; then put it to the other materials, and work the whole well together."

Nicol recommends the border to be formed as follows:—"One-half strong hazelly loam, one-fourth light sandy earth, one-eighth part vegetable mould of decayed tree-leaves, and an eighth-part rotten dung, to which may very properly be added a moderate quantity of lime or shell-marl: these articles should be perfectly decomposed, and intimately mixed, before planting."

M'Phail recommends to "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., has grown for many years, and has been grubbed, is good, or a spit-deep from a common, which has been long pastured, or from the head or end lands of a corn-field, either of which will do very well."

Griffin, of Woodhall, in Hort. Trans., after having rendered the bottom perfectly dry, it is then covered with brick, stone, or lime-rubbish, about six inches thick, and over this is placed a compost of "half good loamy soil with its turf; one-quarter of rich solid old dung, and one-quarter of brick or lime rubbish, the turf well rotted, and the whole well incorporated." Judd, in a communication in the same work, recommends half rich gritty loam from a common, one-quarter of rich old dung, and a quarter of lime-rubbish, tan, and leaf-mould mixed together. These materials, he recommends, to be kept separate, and turned often during the winter, or before they are used. After being well mixed, but not sifted, he lays them on a dry prepared bottom to the depth of three feet. He uses much less dung than is usual in forming borders for this purpose, being convinced that the vine is rather injured than improved by a too liberal application of that material while in

a young state. The borders being prepared, they may be considered fit for the reception of the young plants.

As is the case, in the planting all fruits, much care should be taken in the selection of the plants, both that they be the desired sorts, as well as that they be plants of fitting size and well rooted, without such be the case, there can be little hope of success.

Plants originated from cuttings, and which have been two years cultivated in pots, and have been properly treated and trained as a single shoot, are most generally preferred, particularly by Nicol, Justice, and others; and although many persons prefer plants originated from eyes, or single buds, the latter, if properly treated, are decidedly the best; but it is difficult to procure them equally strong as the former, particularly in the nurseries. Where such plants are preferred, it is, if possible, better to grow them on purpose, or cause them to be grown by some respectable nurseryman. They are generally better furnished with roots, and always make stronger plants than those, which are propagated either by cuttings of considerable length, or originated by layers. The latter mode of propagating the vine is very generally in use, but they seldom are found to make so great a progress afterwards, as those which have been propagated from single eyes.

An expeditious mode of propagating the vine is often practised by Mr. M'Donald, in the Dalkeith Gardens, and described by P. Neill, Esq. in the Edinburgh Encyclopedia, Art. *Hort.* This mode, however, is not applicable, unless in a garden where there are vines already established, or where permission can be obtained in the garden of a friend. Towards the end of June, or beginning of July, when the vines have made new shoots from ten to twelve feet long, and about the time the fruit is setting, he selects any supernumerary shoots, and loosening them from the trellis, bends them down so as to be able to introduce the bent part of the shoot fully within a pot filled with rich mould, which is kept regularly moist. The shoot, thus introduced, should have a portion of the old wood from which it issues, containing a joint, also covered with the mould in the pot; a moist warm air is maintained in the house

during the time the operation is in progress, and in about a week or ten days, the roots will have formed principally from the joint of old wood sufficient to admit of the shoots being disengaged from the parent-plant. It not unfrequently occurs, that the shoot, thus furnished with roots, has upon it one or two bunches of grapes, which, under his excellent management, are found to come to full perfection, even when disengaged from the old plant. Plants, thus originated by the beginning of July, generally attain, by the beginning of October, the length of fifteen or twenty feet. By these means, and under good management, a new vinery might be stocked with plants in three months as completely as most grape-houses are furnished in as many years, in the way and under the management which too generally prevails. It has been supposed, that plants originated by this method, are not so durable as plants by slower means, but this does not coincide with the opinion of Mr. M'Donald. An enlightened horticulturist observes, that, supposing they were found to be less so, it would be easy to keep grape-houses constantly stored with healthy fruit-bearing plants, and that the kinds might be changed almost at pleasure. When it happens, he observes, that too much bearing-wood has been trained in, the plants would be relieved, and sufficient sun and air admitted, by thus removing two or three shoots; and supposing these to contain each several bunches of some fine sort of grapes, they are not lost, but may be ripened by placing them in any other vinery or hot-house, where they would perfect their fruit. Mr. Loudon, with that zeal for which he is so eminently distinguished, as a promoter of horticultural knowledge, suggests the advantage of ringing the layer at or below the tongue, to facilitate the formation of roots.

The borders and plants being in readiness, they may be planted at any time during the winter or spring, so that it is done before the eyes are too much swelled, or the young shoots begin to break. Some, however, even prefer to plant so late as May or June, and in such cases often succeed perfectly. In planting so late, care must be taken to perform the operation carefully, so that the plants may sustain no

check; which, if it should happen, the progress of the vines would be trifling during the first season. In planting, either at an early or late part of the season, the plants should be carefully turned out of the pots, reducing the ball only sufficiently to disentangle the roots that may have grown in a matted manner round the outside of the balls next the pots. The plants should be placed in the pits made for them just as deep as they were in the pots; their roots singled out carefully, and a little well-broken vegetable mould filled in round and among the roots. When thus planted, a little water should be given to settle the mould about their roots. If planted at an early part of the season, they will only require to be protected from severe frosts, or too much wet, till they begin to push young roots. If planted, after they are considerably sprung into shoot, they will require a moderate supply of water frequently, and to be shaded from the sun for a few days after planting.

As the shoots advance, they should be carefully trained into the trellis, allowing only three shoots to remain on each plant, displacing all the others with the finger and thumb. All laterals should be pinched off, except one or two of the uppermost, which should always be left, lest by any accident the leading shoot be injured or broken, and, in that case they may serve for substitutes, although they are never equal to the leading shoot; great care should therefore be taken to guard the principal shoots from injury; and, in tying them to the trellis, sufficient room should be left in the ties to admit of another shoot of equal size, with the view of preventing any injury from the swelling of the shoots.

The two side-shoots left on each plant should be stopped when they advance, the one from five to six, the other from eight or nine feet from whence they spring. The middle or leading shoot should be carefully trained in, as long as it will grow, without stopping.

Air should be daily admitted in a sufficient quantity, according to the weather, so that the shoots may not be drawn up weak, and the temperature regulated in the early part of the season to about 65°; but, as the season advances, and the

plants become stronger, the temperature may be allowed to rise to 70° or 75° ; but the latter point should be considered the maximum, unless for a few hours in clear sun-shine, when the weather is naturally warm. As the plants advance in growth, give a liberal supply of water both at their roots, and over their leaves, to keep them in a vigorous state of growth; for no fruit-bearing tree requires more of that element, while in a growing state, than the vine. Occasional waterings at their roots of the drainings of the dunghill, will be found to be of great service to them; or, as a substitute, water in which rich animal manure has been steeped for some days, and applied to their roots, when it is of the color of porter. The plants should be daily well watered over the leaves with clear soft-water, applied with the syringe with some force, which will tend to keep the red-spider in subjection, as well as refresh the foliage, and keep it clear of dust.

A careful watch should also be kept for the *thrips*, which in dry weather makes its appearance, somewhat similar to the red spider, and will easily be discovered by the curling up of the leaves. On the least appearance of this insect, fumigations with tobacco must be immediately applied, and frequently continued until the insects be quite destroyed. It is no ordinary fumigation that will rid the plants of the *thrips* when once established. It must be applied with greater strength, and continued much longer than for the suppression of the green-fly. Should the latter insect only appear, fumigations less powerful will be sufficient.

This process being adhered to, the vines by the middle of September will have made good shoots, and if the season be very favourable, probably fire-heat will be unnecessary for the purpose of ripening the wood. Should the season be otherwise, and the shoots appear still succulent and green, then slight fires will be necessary. This should, however, be determined, not so much by the state of the weather as by the state of the shoots. If the lower part, by that time, be not turning of a brownish color, it is then decidedly time to apply slight fire-heat, in order to promote the perfection of the wood. It has been justly observed by Nicol, one of our best practical

authors on this subject, that "some would put this matter off, perhaps another month, but if the application of fire-heat be at all necessary, less trouble and expense for fuel will attend the process of ripening the shoots in September than in October. Another consideration is that, as it were, you take up vegetation on the way and hurry her forward to the end of her journey, instead of allowing her to lag behind, and then forcibly push her on against her inclination: a matter of the very first consideration and importance in every species of horticulture."

Very slight fires will be sufficient to effect all that is necessary at this time, but as the season advances, the temperature may be gradually raised, so that the thermometer may stand mornings and evenings about 70° , and at this point it should remain until the shoots be of a brownish color, and sufficiently hard or ripened as far towards their extremities, as it is calculated that they will be cut back to in their autumnal pruning.

As the wood begins to ripen, both air and water must be gradually reduced in quantity until the latter be entirely dispensed with; but this should be done by degrees, somewhat in the proportion in which it is wished that vegetation should stop. The waterings at the roots should be desisted in some time before that of the engine over the leaves, the latter of which will keep the plants less liable to the attacks of the red spider the following season, by destroying great part of its eggs upon the wood of the vines, and also upon the wood-work of the house. By November, the vines will be sufficiently ripened to be pruned for the ensuing season.

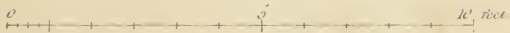
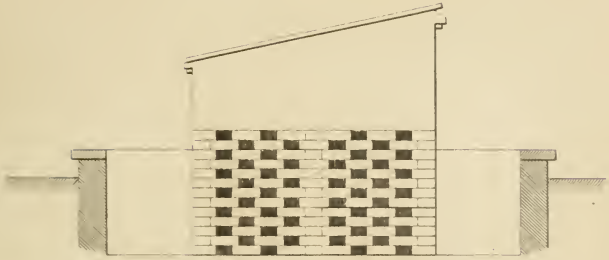
YELLOW CHINA ROSE



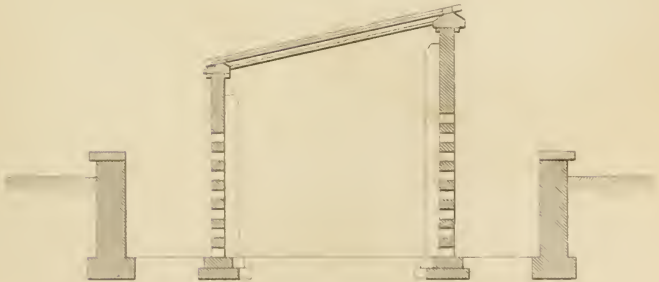
Painted by J. C. Smith,
from a drawing of Mr. G. S. Pittier, from
the Garden of the University of
Geneva.

Late. Forcing. Pit.

End Elevation.



Section.





THE
FLOWER GARDEN.

INTRODUCTION.

MANY and various are the pleasures and advantages to be attained from the study of plants, and the cultivation of them in the flower garden. The first leads to the knowledge of one of the most beautiful and instructive branches of science; and the second furnishes an employment well calculated to lead the contemplative mind, in the language of Shakespeare, to—

“ Find tongues in trees, books in the running brooks,
Sermons in stones, and good in every thing.”

The cultivation of the flower garden must be considered as an amusement extremely well calculated to employ our leisure hours, being one of the most innocent, as well as one of the most salutary employments, that can excite the attention of the human mind. To be employed in contemplating the operations of nature, and in viewing the harmony of her works through the kingdom of vegetables, must make far deeper and more lasting impressions on the mind than all the extravagant vociferations of the enthusiast.

————— “ Not a tree,
A plant, a leaf, but contains
A folio volume.—We may read, and read,
And read again : and still find something new ;
Something to please, and something to instruct
Even in the humble weed.”

A taste for the cultivation of flowers has long occupied the attention of individuals in this country, and the introduction

of that taste may be traced to a very remote date. It occupied the attention of our neighbours on the continent long before the state of this country admitted of such refinement; and, in some parts, it is still carried to that extent, that the annual exportation of bulbs and roots forms no inconsiderable article of commerce.

This taste for flowers has been of considerable service to horticulture in general. The botanist and florist, although acting on two opposite principles of taste, become valuable assistants to the gardener: the one creates, as it were, an endless assemblage of beautiful flowers, by an art peculiar to himself, while the other imparts much valuable information to him relative to the economy of vegetation.

By his exertions, either personally or pecuniary, our gardens are supplied with the vegetable productions of all climates. To him we are indebted for the humble inhabitant of the arctic regions, as well as the magnificent and lofty productions of the torrid zone; from the humble *Linnaea* to the lofty Palm, with many thousand intervening species and varieties of Nature's choicest gifts, with which our gardens abound.

Politically speaking, public pleasure-gardens must be considered as of vast importance, being conducive both to health and pleasure. For which reason we find, in all great cities, that parks, squares, &c., are laid out for the use of those, whose circumstances or employments restrict them to a town life; nor is this confined to our own country, nor to modern times. The public pleasure-gardens on the continent are numerous, and from being considered public property, are protected by the people with a zealous care; every individual considering that, as he has a right to use them, he is also bound to protect and maintain them; and, although they are open at all times, and to all classes, few instances occur of wanton or premeditated injury being done to them.

The private flower garden, which is now the subject of our consideration, forms part of the pleasure-grounds, which latter are defined to be, all or most of the grounds surrounding the dwelling of the proprietor contiguous to the house, and dividing the park or plantations from it, being often denominated

the lawn, shrubbery, &c. The extent of ground occupied for this purpose is not easily determined, but it is always better to have too much than too little. The taste of the owner, the expense which he may be disposed to incur in properly laying it out, and afterwards of keeping it in order, should be considered; and the natural situation of the grounds and style of the house should not be overlooked. In considering this part of the charge of the gardener, we will, for perspicuity, divide it into different heads, and consider them under the denomination of the **LAWN**, the **SHRUBBERY**, the **ARBORATUM**, and the **FLOWER GARDEN**.

LAWN.

The lawn is defined to be an open space of short grass-ground, immediately surrounding the mansion or family residence, and when extended in the principal fronts, adds considerably to the neatness and grandeur of its appearance, by laying them open, and admitting a more extensive prospect from the principal windows.

Where there is sufficient scope of ground, the lawn should be as large as the situation will admit of, as, after its formation and planting, the expense is not considerable of keeping it up. The lawn should be bounded by elegant groupes of shrubbery, but not in continued lines, so as to give the appearance of termination to any part. It should be, as it were, lost in the park, from which it can be divided either by ha-has, or neat and substantial wire-fences; which, while they prevent the intrusion of cattle, will not be visible as such from the mansion. Every thing having the appearance of boundary or fence should be carefully avoided, and the planting of the lawn so managed as to harmonize with the scenery that surrounds the whole. Care should be taken, in planting the lawn, not to shut out desirable objects, such as fine trees, picturesque views of plantations, cottages, villages, &c., if at sufficient distance. But such objects as are of a disagreeable nature, where they cannot be either removed or improved, should be planted out. In planting a new lawn, it is often necessary to plant thick, to produce a more immediate effect,

as well as to provide against deaths, and consequently to introduce many trees and shrubs which are not intended to be permanent. In so doing, care should be taken to plant in situations sufficiently apart, and in proper positions, such trees as will ultimately become the most highly ornamental when they attain their full size; for, from want of sufficient attention in this matter, we often see three or four valuable trees grouped together, so that to save one the remainder have to be destroyed, at the same time that there is probably not another of the same species in the grounds. A knowledge of the size and habit to which all trees will attain, is very necessary for those who have the disposal of them while young, and without this knowledge, all planting must be performed by blind chance. This seems to be too little attended to generally, and a knowledge of arborescent vegetables is studied generally as little as if it did not form a part of the general knowledge of which a gardener should be possessed.

The back grounds, or the parts of the lawn at the greatest distance from the house, should be so planted as to harmonize with the scenery immediately behind them, and in general trees of the most lofty growth should be placed there. However, to produce an immediate effect, it is also necessary to introduce trees of the first magnitude more in front, but those should be chosen which are of the most graceful growth and of the more valuable kinds. Shrubs of tall growth, chiefly evergreen, and trees of the second class, should occupy the middle, and in front, those whose height does not exceed three or five feet.

Upon the lawn, fine specimens of rare, beautiful, or interesting shrubs, and trees of humble growth, should be planted singly, such as *Rhododendron*, *Pæonia Montan*, *Yucca*, *Rosa*, *Rhus*, *Phillyrea*, *Oleæ*, *Magnolia*, *Lonicera*, *Laurus*, *Juniperus*, *Ilex*, *Genista*, *Ephedera*, *Arbutus*, *Erica*, *Cytissus*, *Æsculus*, &c.; and, in sheltered situations, orange-trees, myrtles, many species of New-Holland plants, of large size, and many other large specimens of green-house exotics, should be plunged out upon the lawn during the summer months, and taken under cover during winter, and their places filled with hardy shrubs from the reserve garden, where an

assortment should always be kept of the most interesting, in a portable state, for this and similar purposes.

SHRUBBERY.

The shrubbery may be defined to be the link which connects the mansion and lawn to the flower garden, or to the other parts of a residence, and is most generally planted either for shelter or shade, although often as a screen to hide disagreeable objects, for which the plants which compose it are better suited than for forest or other trees. "The shrubbery," says Nicol, "is often a matter of utility as well as of ornament; in which case it gives the highest satisfaction. When formed for the purpose of shutting out the offices or the kitchen garden from the view of the house; for sheltering the latter, or the garden; or for connecting the house with the garden and the orchard, the shrubbery becomes useful and interesting."

"Sometimes a shrubbery is formed, merely for the purpose of growing rare shrubs and for obtaining agreeable walks. In this case, it is necessary to be at more pains, and to display a greater degree of taste in the laying of it out, than in the formation of the useful shrubbery. In the former case, a tasteful arrangement of the plants is a matter of less importance than the choice and disposition of kinds that will soonest afford shelter, and ultimately become thick screens."

In planting shrubberies for screens to hide disagreeable objects, evergreens should form the principal mass, as affording a permanent blind, and giving a cheerful appearance even in winter. A few deciduous shrubs, of the most showy sorts, may, however, be with propriety added, which will give relief to the more sombre appearance of the evergreens, particularly while the former are in flower; but, from their nature of annually shedding their leaves, and consequently becoming thin in winter, they are not so well calculated for a permanent blind.

In the disposal of the shrubs, the tallest should be planted farthest from the walk, or front side, and the lower in stature in front; but if an immediate effect be desired, it is better to elevate the ground than to plant trees of too great an age.

It is also a matter of importance that they be planted thickly, as it is an easy task to thin them out when required. Little taste has generally been displayed in the formation of shrubberies, as to the production of picturesque beauty; they are planted too generally in the form of sloping banks, without the least natural beauty whatever, and although in this way they may answer the purpose of blinding out disagreeable objects, they become of themselves objects of little merit when seen even from their best side.

Great attention should be paid in their planting, to give them a somewhat natural appearance, and not that of a surface as regular as if they were clipped with the garden shears. Straight lines should also be avoided as much as possible, and the margin of the shrubbery should be broken with deep indentures or sinuosities, and these should be neatly turfed over and kept mown. The walks which lead through this department should not be to any great distance in a straight line, if it can be avoided, neither should they be too much twisted. There is something in a fine gentle sweep or curve so pleasing in a road or walk, that few are insensible of its beauty. The breadth of the walks should be regulated according to the length and scale of the place, as too narrow walks for principal ones have never a good effect; they should scarcely, under any circumstance, be less than five feet wide, and unless for terrace-walks of great length, should not be more than eight; if of greater breadth, they assume the appearance of a carriage-drive, and if narrower, they dwindle in appearance to a mere footpath.

By combining the more distant parts of the grounds with the lawn and house, by means of shrubberies, much may be done, if executed with judgment. Space does not always give the idea of grandeur, for a limited sphere is often better adapted to the display of ornament and beauty. By good management, a small strip of ground may be varied, by taking advantage of the inequality of the ground (if any), or if it be a level and monotonous spot, art can readily step forward and assist by raising banks, sinking the walks, and planting shrubs in thick masses, chiefly of evergreen species, and conducting the walks in the most circuitous manner, so as not to intersect

each other but as little as possible. However, care must be taken to give sufficient breadth of walk and also a margin of grass on the sides of unequal breadths, which will naturally assist in adding to the picturesque appearance of the whole. This may also be aided by forming the banks to be planted of unequal heights, which banks, in small places, need not occupy much surface at their base, so as to admit of as great a breadth of grass margin between them and the walks as possible; in some parts narrow, where it is deemed necessary either for variety or for the more completely concealing objects which should not be seen, at others broad, and disappearing, as it were, in natural glades in the distance. This margin of grass, where of sufficient breadth, should be planted with the finer species of ornamental trees and flowering shrubs, singly, or in groups of three or five together, which would not be seen to sufficient advantage if planted generally amongst the shrubs.

Some attention to botanical arrangement might be paid in the distribution of the shrubs and ornamental trees, but this must not be carried to the extent likely to infringe upon picturesque beauty. However, such families as *Pinus*, *Juniperus*, *Buxus*, *Laurus*, &c., may be grouped with good effect; and if judiciously done, will give a bolder effect to the whole than if they were planted promiscuously. Fine specimens of larger growing kinds, should be so placed as to give effect and relief to the thicker masses of more humble growth. In the back ground may be placed a few fruit-bearing trees, which will display their beauties in spring by their blossoms, and in autumn with their fruit. In such situations also should be planted the stronger growing species of *Cratægus*, *Prunus*, &c.

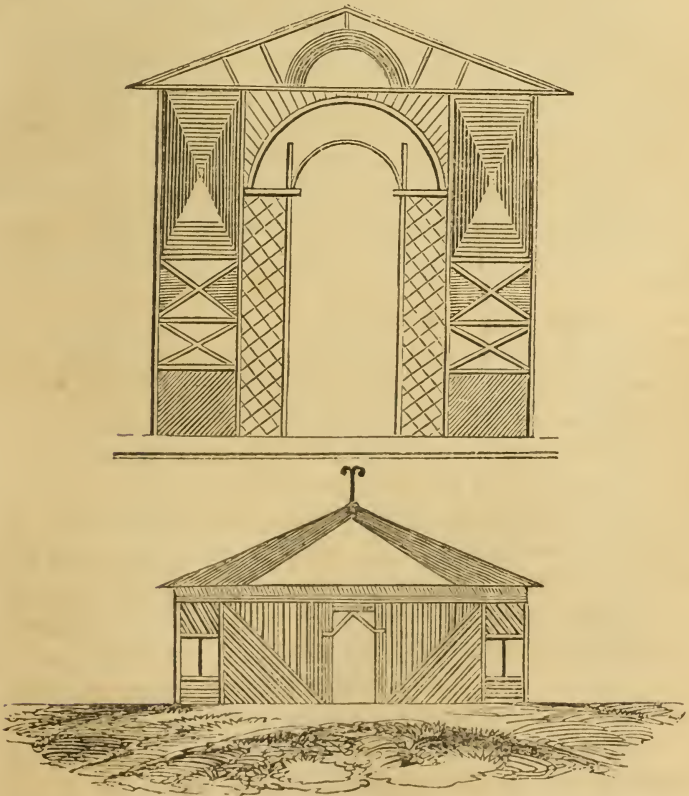
On leaving the mansion, the walks should be conducted through the lawn in a graceful and natural manner to the shrubbery, and should be as much hidden from the principal windows as possible. They should then be continued through the shrubbery, the most circuitous walks leading to interesting objects, so as to relieve the mind and remove the idea that they "lead to nothing;" fine specimens of trees, ruins, either natural or artificial, water, distant views of villages, churches,

woods, cottages, or the like, will always be pleasing; shorter walks should also be contrived on which to return (as most objects lose effect when seen over and over) as well as for a more convenient mode of reaching the more distant parts of the grounds. Neat resting-places should be placed in different parts, choosing the situation of some in shaded groves, others upon elevated spots, commanding the finest views of the grounds or surrounding country. Much taste may be displayed in the formation of such seats, from the polished temple of Flora, Venus, &c., to the rude roots of trees and misshapen fragments of rock or rude stone. Arbours of living trees of flexible habits, such as mountain-ash, willow, ash, &c., may be planted and formed into bowers, and covered over with creeping-plants, such as *Clematis*, ivy, honeysuckle, &c. Moss-houses of various constructions; root-houses; Russian, Swedish, Lapland, Scotch, and Swiss cottages, should be disposed of in situations peculiarly adapted for them. Sometimes situations are naturally to be found adapted for the one or the other; in such cases, the house should be chosen to suit the situation, and this will always be found to have the happiest effect. Where the situation has to be formed for either, much judgment and taste are required in the arrangement. This is not sufficiently attended to. Thus, a Russian cottage, composed of oak-timber trees, and the adjacent ground planted with laurel and other polished shrubs, natives of southern latitudes, and close-shaven grass lawns, is as preposterous as the chaste Grecian temple in a rocky dingle. The grounds should be chosen or arranged so as to persuade the observer that he is really in Russia, and the house should be composed of the same timber trees used in the formation of cottages in that country, and be of the same form and size. The internal construction and furniture should also come as near to reality as possible. Hermitages and caves are also interesting, when proper situations are chosen. In the former should be kept a small collection of books calculated for private study, and the furniture of this sequestered retreat should be exactly of that simple and useful nature as would be suitable to a recluse.

Caves should be hewn out of the solid rock, or if artificially formed, should be cased over with rough stones, so as to give

as little the appearance of art as possible ; the access should be rather rough and even difficult, and the entrance such that the supposed inmate might dispute the passage. The furniture should be of the most rude and simple form possible, such as a savage man might be supposed to use, or such as an outlaw would be glad to accommodate himself with. Nothing like dressed ground should be seen from it, and no vestige of it should be seen until at the entrance.

Rustic seats of various constructions, when properly situated, are no less useful than interesting, even when considered merely as ornaments. The accompanying sketches may be adopted or improved.



In grounds through which streams of water flow, bridges of various constructions should be placed, and here, as well

as in the formation of resting-places, much taste may be displayed, from the neat Doric bridge of polished stone to the rude mountain-bridge of unhewn timber; the one suited for the dressed lawn, and the other for the wilderness or dingle.

ARBORATUM.

The arboratum is a division of the pleasure-ground dedicated to the cultivation of a collection of useful and ornamental trees. It is to be regretted that so few specimens are to be met with in this country of this extremely useful and interesting part of gardening. Such however is the case, and we know not of one complete collection in the country. The arboratum may be situated in any convenient part of the pleasure-ground, if large; but if small, the distribution of the trees should be blended through the lawn, shrubbery, and flower-garden; and, if planted with taste, will add much to the general beauty of the whole. In their arrangement, some attention should be paid to a particular mode of classification, so that at least all the species of one genus may be brought together. The families which constitute the principal mass of this collection, are —

Linnæan Names.	English.	No. of Species.
Acer.....	Maple	Twenty-one.
Acacia	Acacia	One.
Æsculus	Horse-Chestnut	Five.
Ailanthus	Ailanthus	One.
Alnus	Alder	Eleven.
Amygdalus	Almond	Five.
Araucaria	Chili Pine	One.
Arbutus ...	Strawberry-tree	Two.
Betula.....	Birch	Ten.
Bignonia	Trumpet-flower	One.
Buxus.....	Box-tree	One.
Castanea	Chestnut	Two.
Catalpa	Catalpa.....	
Carpinus	Hornbeam	Three.
Celtis	Nettle-tree	One.
Cercis	Judas-tree	Two.
Comptonia	Comptonia	One.
Cornus	Dogwood	Four.
Corylus	Nut-tree ...	Five.
Cratægus	Thorn	Twenty-one.

Linnæan Names.	English.	No. of Species.
Cupressus	Cypress	Six.
Cytisus	Cytisus	One.
Diospyros	Date Plum	Two.
Euonymus	Spindle-tree	Four.
Fagus	Beech	Three.
Fraxinus	Ash	Nine.
Gleditschia	Gleditschia	One.
Gymnocladus	Gymnocladus	One.
Halesia	Halesia	Two.
Ilex	Holly	Three.
Juglans	Walnut	Fourteen.
Juniperus	Juniper	Ten.
Kœlreuteria	Kœlreuteria	One.
Laurus	Laurel	Six.
Liquidambar	Liquid-amber	Two.
Liriodendron	Tulip-tree	Two.
Magnolia	Magnolia	Nine.
Mespilus	Mespilus	Thirteen.
Morus	Mulberry	Nine.
Nissa	Nissa	Four.
Pinus	Pine	Twenty-seven.
Platanus	Plane-tree	Four.
Populus	Poplar	Seventeen.
Prunus	Plum	Fifteen.
Pyrus	Pear	Sixteen.
Quercus	Oak	Fifty-four.
Robinia	Robinia	Nine.
Salisburia	Maiden-hair-tree	One.
Salex	Willow	Thirty.
Sambucus	Elder	Three.
Taxus	Yew	Two.
Tilia	Lime-tree	Five.
Ulmus	Elm	Sixteen.

Of these families, that of QUERCUS, the OAK, may be considered the most valuable. To the common oak, *Quercus robur*, we are indebted for the materials which form the bulwarks of our national safety, and glory as a nation. It has been noticed at a very early period, and is elegantly described by the majority of the ancient poets.

This valuable tree attains a greater size than any other vegetable production indigenous to this country.

The *Quercus sessiliflora*, of English botany, has been more abundant with us formerly than at present; the superior qua-

lity of its timber may have been the cause of its almost extirpation. Few trees of any considerable size are now to be met with compared with the *Quercus robur*. The roof of Westminster-Hall, long supposed to have been of chestnut, is of this timber, and has stood undecayed for ages, and is supposed to have been brought from Ireland.

The evergreen oak, *Q. ilex*, and its varieties, add considerably to the beauty and elegance of our shrubberies and pleasure-grounds.

The CORK OAK, *Q. suber*, besides being an ornamental tree on our lawns, is of much real utility; the exterior bark is imported by us from the south of Europe, to be manufactured into corks and other useful purposes. The bark of the cork-tree, as well as the acorn, is of some use in medicine, being both reputed astringents. The Spaniards burn the bark to make that kind of light black which painters call Spanish black. The Egyptians made coffins of cork, which being lined with a resinous substance, preserved dead bodies uncorrupted. The Spaniards often line the walls of their houses with it, which renders them warm, and corrects the moisture of the air.

The TURKEY OAK, *Q. cerris*, and its varieties, is now found to be an extremely useful timber tree, and in many situations would be more profitable, if planted, than those of our own country.

Next to the oak family, in point of general utility, may be ranked the pine, or fir. Of this family, few arrive in this country of a size to be of general utility, excepting the Scotch *Pinus sylvestris* and larch *P. larix*; however, the timber of several other species are imported by us both from America and the north of Europe, which are well known for their durability and usefulness in building: some of the Norway houses, built of entire trees of the red fir or pine, are supposed to have stood upwards of four hundred years. In Gulbrandsdale, the house is said to be still standing in which King Olaf lodged five nights above seven hundred years ago. As ornaments to the park, the lawn, and pleasure-ground, the whole of this family become exceedingly interesting. Of

these, the *P. clanbrassiliana*; *P. lanceolata*; *P. pinaster*; *P. longifolia*, although a native of the East Indies; *P. cembra*, *P. pichta*, and *P. adunca*, are highly interesting.

Nearly allied to this family are the magnificent family of *Araucaria*, the Chili pine; *A. imbricata*, is found to be sufficiently hardy to stand out in favorable situations. It is, however, still rare. Should it become more common, no tree with which we are acquainted would be a greater ornament to our arboratums.

The CHESTNUT family afford us trees very ornamental to our parks and lawns; and the fruit of the common chestnut, *Castanea vesca*, is used in our deserts. It attains a great size, and is a valuable timber-tree.

The BEECH is also an ornament to our parks and pleasure-grounds. The variety with dark purple leaves, produces a good effect in garden scenery; it was originally discovered in one of the German forests, and is now generally met with in our pleasure-grounds. It is botanically considered only a variety of the common beech, *Fagus sylvatica*. It may be mentioned, as an additional illustration of the importance of this family, that the seeds of the *F. sylvatica*, when freed from the husk or outer envelope, afford by pressure one-sixth part of a fixed oil of excellent quality; and considered, when properly managed, to be equal to that of olives. This oil is prepared in great quantities in Germany and the north of France, from seeds obtained from the forests of Crecy and Compeigne.

The POPLAR family afford us a greater variety of beautiful foliage than that of almost any other tribe; that of *Populus tremida* and *P. tremula* possess a singular motion of their leaves, which has not been satisfactorily accounted for. The fragrance of *P. balsamifera* is very agreeable, and consequently it often finds a place in our shrubberies. It seems a neglected genus that merits more general cultivation. It is of very rapid growth, and flourishes in situations where few other timber-trees would thrive. Several of the species also promise to become useful for building purposes.

The BIRCH family are peculiarly interesting; the white birch, *Betula alba*, and its varieties, assuming very graceful

habits of growth; that of the weeping variety, *B. alba var. pendula*, is much cultivated. In some places it is almost naturally as abundant as the varieties with upright branches.

The ALDER is a neglected family; few species being generally met with in cultivation.

The NUT-TREE, *Corylus*, although properly belonging to the orchard or fruit-garden, should nevertheless be always planted in a collection of trees. Their habit of growth, and their growing in the shade, render them useful in this department, as underwood in the arboratum, where it is wished to blend picturesque beauty with scientific arrangement.

SALISBURIA. — Of this genus we have but one species, *S. adiantifolia*, a native of Japan. With us, in favorable situations, it becomes a tree of the third class, and is extremely interesting; the foliage being so singularly divided. Fine specimens of this tree are to be seen in the grounds of the Mile-End nursery.

The PLANE-TREE attains a considerable size with us, and is very ornamental. The *Platanus orientalis* and *P. occidentalis* are described as growing to an amazing size; the latter is a native of America, where it has been known to attain the circumference of forty feet at five feet from the ground; and T. André Michaux measured one of still greater dimensions, and in full growth. These trees are, from their rapid growth and fine general outline, highly ornamental; but they require a good soil, and one that is neither too thin nor too dry.

The MAPLE family are a very ornamental tribe of trees. The *Acer campestre*, common maple, has long been valued, on account of its timber and quick growth. The sycamore, *A. pseudo-platanus*, is also a magnificent tree of the first class; the wood of which is both beautiful and useful. The sugar maple, *A. saccharinum*, is an extremely hardy tree, and is found to prosper in Canada under the most rigorous cold, in lat. 48°, nearly corresponding in temperature to lat. 67° in the north of Europe. The juice is also converted into excellent vinegar, in the usual manner practised by vinegar manufacturers. Sugar is also obtained from the juice in considerable quantities (hence the name). Some years ago, the Prince

of Augsburg planted above a million of maple-trees of one of the European species, for the express purpose of manufacturing sugar for home consumption.

The ASH family, *Fraxinus*, is both useful and ornamental. The common ash, *F. excelsior*, attains a large size in this country, and has long been in demand by the coach-builder and the makers of agricultural implements. Evelyn, in his *Sylva*, states, that trees of this species, of forty years growth, from seed, sold for thirty pounds each; an extraordinary price for timber in those days: and that a gentleman had a plantation of this tree, of his own planting, which was valued at fifty thousand pounds. Of this species there are five curious varieties to be met with in collections. Of these, the *F. excelsior* var., *argentina*, and var. *pendula*, are great ornaments to the lawn or shrubbery, and the yellow-barked, or golden *F. aurea*, is not only while in leaf, but also when without leaves, an interesting tree.

The *F. ornus*, or manna ash, produces the medicinal manna, and is also an ornamental tree. In the country to the eastward of the Missisipi, including Canada and the United States, the younger Michaux supposes not less than thirty species of this valuable tree to exist; all of which have never been at any period in this country. Since the beginning of this century, no less than fourteen species have been introduced from North America alone; still it is surprising that not above four or five species are in general cultivation, even when considered as ornamental trees only. The *F. Americana* is no less interesting from the magnificence of its growth than for the beauty of its foliage: it abounds from the northward of Hudson River to the southern limits of Jersey and Pennsylvania, and attains the height of eighty feet. It also endures the severest cold of Nova-Scotia and Canada without any diminution of size; and where planted in this country bids fair to prosper to the utmost of our expectations.

The *ÆSCULUS* family are exceedingly ornamental, and are more generally met with in pleasure-grounds than any other family of arborescent plants. The beauty of their flowers, as well as the elegant palmet form of their foliage, have led to their being more generally admitted into the pleasure-ground than

almost any other tribe of trees taken collectively. From the many venerable specimens of *Æ. hippocastanum*, the common horse-chestnut, which are to be met with surrounding the mansions of the great, seem to prove the attachment which our ancestors entertained for this tree, and also that some care had been paid to their early cultivation, as they are natives of the north of Asia, and introduced here in 1629. The beauty of the flowers, and elegant form of this tree, and not the value of its timber, render it an object of interest. This tree is supposed to have been brought into Europe by way of Vienna, from thence into Italy, and then into France and England; but Langley is of opinion that it was brought into England from the Levant.

The *Æ. pavia*, *Æ. flava*, *Æ. parviflora*, *Æ. discolor*, and *Æ. hybrida*, lately and very justly formed into a separate genus, under the denomination of *Pavia*, are of humble growth compared with those allied to the *Æ. hippocastanum*; they are nevertheless exceedingly ornamental, planted either on the lawn or in the fronts of shrubberies.

The LIME family, or Linden-tree, *Tilia platyphylla*, *T. europea*, of English botany, are amongst the most elegant ornamental trees, and attain a large size. When planted sufficiently distant from other trees, they often assume a head perfectly conical. Our ancestors seem to have chosen them for planting avenues, when that style of planting was in vogue. Evelyn was so partial to the lime, probably from its supposed medicinal properties, that he purposed planting one before every door in all the broad streets of London.

The WALNUT family, *Junglans*, are both ornamental and useful as a timber-tree, and the fruit adds to the variety of our deserts. They are natives of America. The *J. regia* common walnut is, however, indigenous to Persia, whence it was brought into this country. It is said that trees of this species, which have their fruit beaten off instead of being gathered, are more fruitful; and, agreeably to this idea, the Italians beat or thrash their trees with poles full of nails or stubs of iron, on purpose to lacerate the bark.

The ELM family.—In point of utility, few trees can surpass our native common elm, *Ulmus campestris* (of English

botany,) and its varieties, as a timber-tree; and many of the species are also extremely interesting for their graceful habits and diversity of foliage. The Hort. Soc. seems, from its collection of this genus, to pave the way for their more general cultivation. The various species may be propagated by being grafted upon the Dutch or English sorts.

The DATE PLUM, *Diospyros Lotus* and *D. virginiana*: the former a native of the south of Europe, and the latter of America; two interesting species. From the bruised fruit of the latter, cakes are formed, which are dried in an oven, and warm water being added to them, produce a liquor which, when fermented, is used as beer. With us, the fruit is not likely ever to arrive at any degree of perfection, but the beauty of the foliage is sufficiently interesting to deserve a place in our shrubberies or upon our lawns.

The HORNBEAM family.—The common hornbeam, *Carpinus Betulus*, attains the size of a tree of the first class when raised from seed, but unfortunately this tree, like too many of our best ornamental trees, are propagated from layers; by which mode of propagation, they are found to succeed at almost any period of the year. The consequence is, that so few trees of this species are to be met with of a full size; a stunted progeny being the reward of a mode of propagation so unnatural.

ALMOND family.—Of these, the common almond, *Amygdalus communis*, is well known for the beauty of its blossoms in spring; of this species we possess several varieties. The *A. communis* is supposed to have been introduced from Africa into Italy, and thence into this country; and although a fruit-bearing tree, still with us it cannot be considered generally as being valued for that property, as for the beauty of its blossom. It attains the size of a tree of the fourth class, and produces ripe fruit in favorable situations.

The TULIP-TREE, *Liriodendron tulipifera*, attains with us the size of a large and lofty tree, and is well suited for the lawn or arboratum; the beauty of its foliage, together with its large white flowers, render it altogether one of the most interesting of our large growing trees for garden scenery. In

America it attains the size of a tree of the first class, often growing to the height of forty or fifty feet of trunk, and thirty feet in circumference, and is considered a valuable timber. Canoes are formed of the hollowed trunks. The leaves grow irregularly on the branches on very long foot-stalks, and are of a peculiar structure, being composed of three lobes, the centre one of which is much shortened, and appears as if cut off and hollowed in the middle. The magnificent large tulip-like flowers are produced with us in July, at the extremity of the branches.

PLUM family.—Of this family, with us the *Prunus padus* sometimes attains the size of a large tree, but most generally assumes the habit of a shrub of the largest size. Pennant mentions seeing one in the gardens of the Duke of Queensbury seven feet and a half in circumference. The whole genus is exceedingly interesting, from the cultivated plum of the highest flavor to the insipid sloe, *P. spinosa*. All of this genus deserve situations in our pleasure-gardens, and are much valued, on account of the fragrance of some and the beauty of all their blossoms. The cultivated plum, *P. domestica*, with training, attains the size of a tree of the third class, and is much prized by the cabinet-maker.

The CHERRY family are nearly related to the latter in many respects; but, as forest trees, the cherry is more valuable, although the fruit of the uncultivated kinds are less extensively useful. Two of our native cherries are valuable as timber-trees; the black cherry, or Guigne of the Scotch, *Prunus cerasus*, and the red cherry, *P. avium*; both species attain the size of trees of the second class, and are ornamental in our woods in spring, from the beauty and profusion of their blossom; in summer, their fruit is both grateful and high-flavored; and in autumn, the foliage early takes beautiful tinges of red, which render them great favorites of the artist. The gum which oozes from *P. cerasus*, is said by Hasselquist to be very nutritious; he asserts that, during a siege of two months, above a hundred men were kept alive by no other sustenance than a small piece of this gum, which they each suffered to dissolve gradually in his mouth. The timber of

this tree is of great value, and for many purposes equal to mahogany.

LABURNUM family, *Cytisus laburnum*. Of this species there are supposed to be two varieties; that which is called Scotch laburnum is most prized, as attaining a greater size, as well of timber as in the foliage and flowers. As an ornamental tree, on the lawn or in the skirts of plantations, it stands unrivalled, and is generally admired both for its large trifoliated leaves and elegant bunches of yellow flowers; often exceeding a foot in length. As a timber-tree it is also valuable, and is found to attain a large size in soils of the poorest description. It is to be regretted that too little attention has hitherto been paid to the cultivation of it as a timber-tree.

ROBINIA family.—Of this family, the *Robinia pseudo-acacia*, or false acacia, is inferior neither in point of beauty as an ornamental tree upon our lawns, nor as a timber-tree of the second or third class, to any tree cultivated. Its beautifully pinnated foliage, and elegant white blossom, render it worthy of being extensively cultivated as an ornamental tree, and its great durability renders it equally worthy of cultivation as a timber-tree. It is much esteemed in America for its durability, and is always used where timber of that nature is required. The other species of this beautiful genus are equally interesting as ornamental trees, either on the lawn or in the shrubbery.

MULBERRY family. Of this family, the *Morus Nigra*, the common black mulberry, although considered as a fruit-bearing tree of great value, is not undeservedly often planted on the lawn, and probably it is the best situation for it. It has been long cultivated in this country, and appears to be a tree of great longevity. As a timber-tree it has no pretensions, as being of slow growth, and attaining only the size of a tree of the third or fourth class. The *M. rubra* attains the size of a large tree, often seventy feet in height, and of a proportionable diameter, in Virginia and Pennsylvania, and probably might be with advantage planted in our most sheltered woods as a timber-tree; on our lawns it cannot fail of being admired, as well as its associate the *M. alba*.

Few evergreens with us attain the size of timber-trees, those of the genera *Quercus* and *Pinus* excepted. For a list of the principal of them, with their heights, &c., see the *Systematic Catalogues*.

FLOWER GARDEN.

Almost all writers on this subject agree in placing the flower garden near the house, that it may be readily had access to at all seasons. In small places, or cottage or villa residences, this may be desirable; but in places of considerable extent, and particularly where the mansion is large, we would propose to have the flower garden at some reasonable distance from it, and to be reached by a sufficiently broad and dry gravel-walk, extending through some part of the lawn and shrubbery. In all cases, unless in small villas or cottage residences, the flower garden should be entirely concealed from the windows of the house, and be placed, if circumstances will admit of it, in the shrubbery. Situations are, however, often to be found naturally calculated for the site of the flower garden; and these situations should, in most cases, direct the designer as to style, form, and extent. Natural situations never should be lost sight of in selecting a station for the flower garden. The surrounding scenery, both as regards shelter and picturesque beauty, will, in many cases, be found better and more interesting when almost naturally formed than when artificially planted. Irregularity of surface is often desirable in the choice of a situation for a flower garden, and many attempts have been made to attain this artificially. Of this sort of art was Pope's garden at Twickenham; and Lord Harcourt's, at Nuneham, was upon the same principle; both much admired, and both the production of poets: the latter being laid out by Mason, and the former by its owner.

Where the proprietor has a taste for flowers, and the situation of sufficient extent, it will be found, in most cases, to have the happiest effect to have several small flower gardens in preference to one large one. Abercrombie justly observes, that to cover twenty acres with mere flowering plants, would

be puerile and ridiculous, as it would exceed the moderation with which nature scatters her ornaments. Indeed, flower gardens of such extent partake more of the nature of the pleasure-grounds, and admit of a great portion of the surface being covered with grass, as well as the borders being planted with shrubs and trees of the less lofty species; without which, the whole would have a naked and mean appearance. Flower gardens upon a moderate scale, rather small than otherwise, admit of their being kept with greater neatness, and will therefore be the more pleasing; and if properly disposed through the pleasure-ground, cannot fail of adding much to its interest. Thus a garden might very properly be denominated the winter garden, planted chiefly with evergreens; however sombre their appearance might be in summer, when all around is gay, still in winter it would give rise to pleasing associations in beholding them retain their verdure and clothing at a season when the other flower gardens are naked and bare.

Another might very properly be denominated the American flower garden, and should be situated in rather a damp situation, or rather one that could be rendered so during the heat of summer by partial irrigation. Such a garden may be complete of its kind, having not only herbaceous plants of great beauty, but also shrubs, deciduous and evergreen, as well as many highly ornamental trees. The soil of which it should be composed, should be of the sort called peat or bog-mould; and being of a very dark color, will form a contrast with the brilliant flowers of which American plants are eminently possessed.

Another might be styled the Botanic flower garden, where a collection of hardy plants might be cultivated to a great extent and variety, and planted according to some arrangement, either natural or artificial. The arrangements generally adopted is either that of the sexual or Linnæan system, which is strictly artificial, and therefore less fit for planting a garden by, as it brings together plants that have few or no relations to each other, and destroys that harmony which is so gratifying in viewing natural families. The arrangement of Jussieu has much the best effect in garden scenery, as well as corres-

ponding better with their cultivation. For private botanic gardens, where the collection is not completed at its formation, but yearly additions made to it, the most convenient method of disposal is by grouping upon turf; and as the plants of any class increase, the beds can be enlarged in proportion, by appropriating part of that which was turf into border for them. These groups should be of the most irregular forms possible. A walk of gravel should be so contrived as to make a tour of all the groups, and that of a continued scroll, as in the accompanying sketch, may be the most convenient. In this sketch we have adopted the sexual system of arrangement, and have given a group or clump for each of the twenty-four classes, (numbered 1 to 24,) not including aquatic plants, or such as are not conveniently cultivated in the borders. Aquatic, bog, and Alpine plants, particularly such of the latter as are liable to perish in winter, or be overlooked in consequence of their minute growth, should be cultivated in groups by themselves.

25, 25, rock-work, where such Alpine plants may be cultivated as would be liable to be lost or overlooked if in the general arrangement.

26, 26, should be rendered capable of retaining water sufficient for the cultivation of such as are natives of bogs or watery places.

27, a border prepared for a collection of plants with variegated leaves, or such as degenerate into singular varieties or monstrosities.

28, 29, 30, and 31, borders for dahlias, carnations, pinks, bulbs, and similar showy flower garden plants, and in summer to be enriched with scarlet geraniums, and other interesting green-house plants.

Flower gardens, laid out according to systematic arrangement, will only be appreciated by those who are attached to that delightful study, or by such as pride themselves in the number of species that they possess. Few attempts have been made in this country of blending botanical arrangement with picturesque beauty in our flower gardens; that of the celebrated Dr. Darwin was probably the most complete. The numerous species of plants which necessarily enter into a botanical arrangement, although extremely interesting to the lover of that

science, are yet overlooked by the majority of persons, and by many are considered as mere weeds; and while such ideas



exist we cannot expect that this sort of flower garden will become by any means general.

The Changeable Flower Garden To this style of gardening the Chinese are extremely partial, and they are well skilled in it. It is by no means an unusual circumstance for a mandarin to have the whole of his flower garden completely changed in the course of one night, not only in the arrangement of the plants, but also in that of the beds or compartments. For this purpose, the plants are all portable, and are cultivated in a reserve-garden in pots; and when any individual plant or genus of plants decays or goes out of flower, others are immediately substituted for them; and when the whole are to be changed, they are removed to the reserve-garden, where there is always a stock kept up sufficient to replant the whole. Gardens of this description are described by Sir W. Chambers in his work on oriental gardening. The Chinese, he observes, are particular in the arrangement of their flower gardens; they do not scatter their flowers indiscriminately about their borders, but dispose of them with great circumspection along the skirts of the plantation, or other places where flowers are to be introduced. They reject all that are of a straggling growth, of harsh colors, and poor foliage; choosing such only as are of some duration, which grow either large or in clusters, of beautiful forms, well-leaved, and of tints that harmonize with the greens that surround them. They avoid all sudden transitions, both with regard to dimension and color, rising gradually from the smallest flowers to the hollyhocks, pœonies, sun-flowers, carnation poppies, and others of the boldest growth; and varying their tints by easy gradations from white, straw-color, purple, and incarnate, to the deepest blues, crimsons, and scarlets. They frequently blend several roots together whose leaves and flowers unite, and compose one rich harmonious mass, such as the white and purple candy-tuft, larkspurs, and mallows of various colors; double poppies, lupins, primroses, pinks, and carnations, with many more of which the forms and colors accord with each other; and the same method they use with flowering-shrubs, blending white, red, and variegated roses together; purple and white lilacs, yellow and white jessamine,

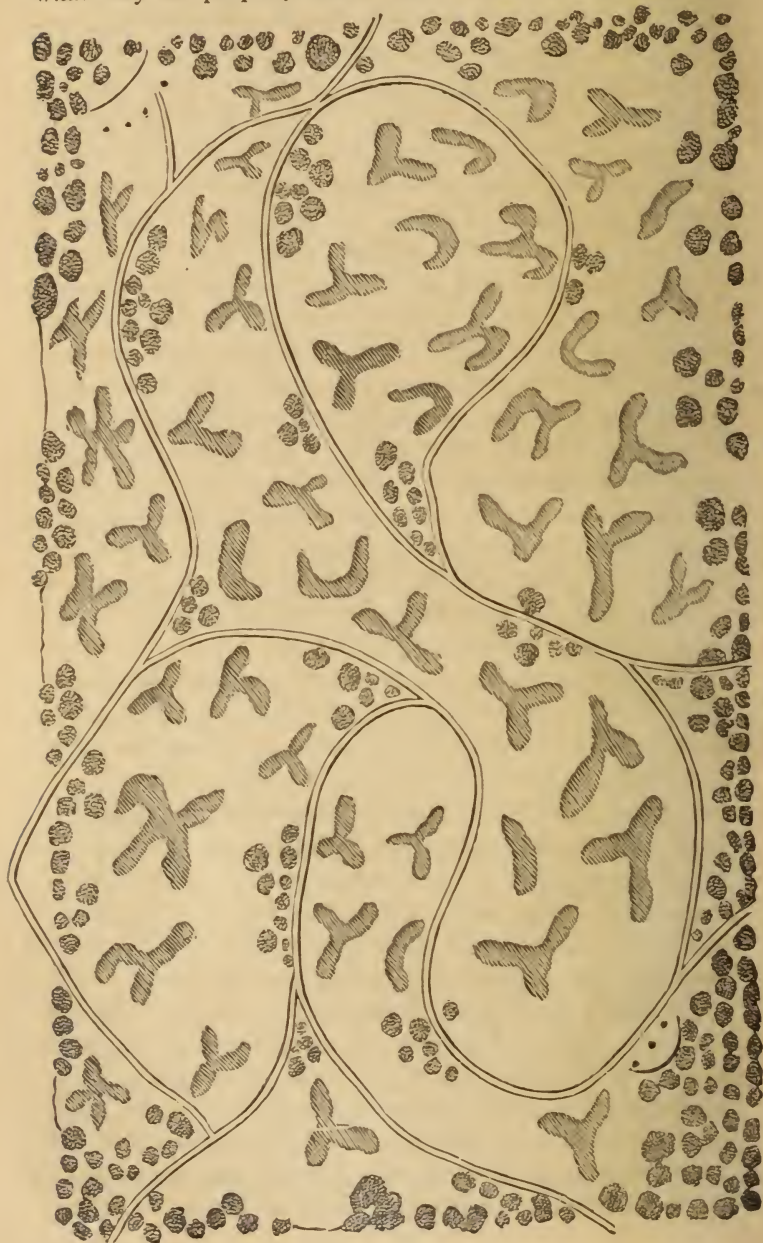
altheas of various sorts, and as many others as they can with any propriety unite. By these mixtures, they increase considerably the variety and beauty of their compositions. In their large plantations, the flowers generally grow in the natural ground; but in flower gardens, and all other parts that are highly kept, they are in pots buried in the ground, which, as fast as the bloom goes off, are removed, and others are brought to supply their places; so that there is a constant succession for almost every month in the year, and the flowers are never seen but in the height of their beauty.

Something of the same kind is practised in France during the summer, and some few attempts have been made in this country to effect the same purpose. With some conspicuous families of flower-garden plants, it ought to be more attended to; such, for instance, as *Dahlia*, *Chrysanthimum*, *Lobelia*, *Pelargonium*, *Helianthus*, *Aster*, *Heliotropium*, *Salvia Splendens*, *Senecio elegans*, *var. pleno rubra*, and *var. pleno alba*, and many others; which, if grown in large pots, and brought into the flower garden when coming into flower, in place of others which may be on the decline, would keep it always gay, without being, as it were, encumbered with the plants while in a state of growth or decay.

Upon a small scale, much might be done in this manner with good effect; but upon a scale of such magnitude as we find many of our English flower gardens, it would be next to impossible to produce any good effect in them.

The Mixed Flower Garden, of which the accompanying sketch may be considered an example, is that generally aimed at by gardeners, and consequently that which is most commonly met with. There plants, shrubs, trees of all denominations, are admitted too often in heterogeneous masses, without the least attention being paid to their distribution as far as regards the heights which they bear to one another; their colors, time of flowering, or the effects that they ultimately or immediately have in landscape. Many err in planting this sort of garden, by introducing by far too many species, and those often are ill selected. To produce a brilliant and constant bloom of flower, is the object of this garden, and that can be effected by a limited number of species, if properly

arranged and selected. A moderate number of select sorts, or what may be properly called good border flowers, and that



number selected equally from the different colours of such plants as are known to flower from February to October, are what ought to demand the exclusive attention of those who would plant a flower garden of this sort. Rarity and variety should not be condemned, but it is always better to have such confined to the botanical flower garden, or in a border either alphabetically or classically arranged; here they will be more immediately under the eye of the cultivator, and less liable to be destroyed or lost. Indeed, in every garden where there is any thing like a collection of plants, some sort of arrangement should be adopted, both as a nursery and an index to point out the exact species of which the collection consists, as well as what species are lost. It is observed by an intelligent writer upon this subject, that flower gardens have been on the decline in this country for the last half century; and the cause assigned is, that the great influx of new plants, during that period, has induced gardeners to be more solicitous about rare and new plants than well-disposed colors and quantity.

Little attention has been practically paid to the disposal of flowers, so as to have the advantage of producing the best possible effect. The authoress of the *Florist's Manual*, a little work which ought to be in the possession of every young gardener, presents some very just observations upon this subject. "The fashionable novice," she observes, "who has stored her borders from the catalogue of some celebrated name, with variety of rare species; who has procured innumerable rose-trees, chiefly consisting of old and common sorts, brought into notice by the new nomenclature; who has set apart a portion of her ground for American plants, and duly placed them in bog-soil, with their names painted on large-headed pegs, becomes disappointed, when, instead of the brilliant glow of her more humble neighbour's *parterre*, she finds her own distinguished only by paucity of color and fruitless expenditure. Variety of species, bog-plants, and largely-lettered pegs, are all good in their way, but they will not produce a gay flower garden; and the simple cause of the general failure, in this particular, is the solicitude which at present prevails for rarity and variety, in preference to well-blended quantity; as, without the frequent repetition of the same plant, it will be in vain to

attempt a brilliant flower garden, as the art of procuring it consists in the judicious mixture of every common color. Hence, the foundation thus laid, the solicitude of those who wish to complete the superstructure, must not be for rare species, but for new colour, so that the commonest *primula* which presents a fresh shade of red, blue or yellow, &c., ought to be esteemed more valuable than the most rare American plant, which does not bring a single advantage. In the formation of that assemblage of flowers, which may be distinguished by the term of the mingled flower garden, it is essential that the separate parts should in their appearance constitute a whole; and this appearance is not incompatible with any form in which the ground may be thrown, if attention be given to the manner of planting. In some gardens, this appearance of a whole is entirely destroyed by the injudicious taste of setting apart distinct borders for pinks, *hepeticas*, *primulas*, or any other favorite kind of flowers; also for different species of bulbs, as *anemones*, *ranunculuses*, *hyacinths*, &c.: these distinct borders, though beautiful in themselves, break that whole, which should always be presented to the eye by the mingled flower garden, as single beds, containing one species, only form a blank before that species produces its flowers, and a mass of decaying leaves when the glow of their petals is no more. The reverse of this mode of planting is essential to the perfection of the mingled flower garden, in each border of which there should be at least two of every species, but the precise number must be regulated by the force of color displayed by the plant, and the size and the relative position of the borders."

The disposal of the margin, or surrounding plantations, also require much judgment and taste, so that the whole may harmonize with the arrangements within; and while they afford sufficient shelter, they should not be crowded nor yet have a hedge-like appearance. This plantation, if not naturally existing, must be planted; and probably, if partly surrounded naturally, will require some artificial assistance, either to render the shelter sufficient or to improve its appearance. In such cases, the most ornamental trees and shrubs should be placed in front, and in the most conspicuous places; and if

the extent of the flower garden be great, some of the most curious and interesting may be introduced upon the grass, or in the larger of the clumps or groups; and if properly placed, will have a good effect. Attention should also be paid here to dispose of the surrounding trees and shrubs so as to produce a good effect in the coloring even of the foliage, and particularly the habit of the trees. To produce a pleasing effect in planting, the trees should be planted with judgment and with a painter's eye.

The ALPINE OR ROCK GARDEN.—Gardeners generally denominate all plants Alpines, that are of very humble growth, and that require some protection during winter, whether they be really natives of Alpine situations or not. To these they add many species that are of difficult cultivation. In considering, therefore, the Alpine or rock garden, we will suppose it to contain all such plants which, from their minute size, rarity, or difficulty of propagation or cultivation, are excluded from the other flower gardens, and look upon it as a garden of vegetable curiosities rather than as one in imitation of rocks and mountains, at which man at the best is but a puny imitator.

In the Alpine garden, a small pond or large cistern should be made for those aquatic plants which are curious or minute, such for instance as *Lobelia Dortmanna*, *Subularia*, *Chara's*, *Pilularia*, and *Isoetes*, &c.; and if the proprietor be of a botanical turn of mind, he may introduce as many species of *Conferva* and *Bissus* as he can cultivate.

A small bog should also be made for the cultivation of many plants, extremely beautiful in themselves, but which require a degree of humidity at their roots not convenient to be applied by any other means; here all the curious species of *Eriophorum*, *Pinguicula*, *Drosera*, &c. may be cultivated.

This beautiful and truly interesting assemblage of plants requires to be viewed closely before their real beauties are discovered, and therefore the nearer they are brought to the eye of the observer, the more readily their beauties are seen. Plants of such humble growth, and liable to so many accidents, are not in many cases fitted for the borders of the

flower garden, neither are they found to succeed well if planted out.

It is seldom attempted to give a natural effect in laying out rock-works, the design of them being generally merely for the better cultivation of plants which grow naturally upon elevated situations, and are liable to be destroyed when mingled with the larger and more hardy species in the flower borders. In choosing the situation for a rock or Alpine garden, it is important that it be exposed to a free circulation of air, and containing, either naturally or artificially, portions fully exposed to the sun, as well as others completely shaded, and if a small rill of clear water can be brought through it, it will add to its advantages. The plants entering into this sort of garden, depend for support more upon a pure air than upon richness or depth of soil. Sometimes situations naturally occur, where objects or situations in themselves uninteresting and even offensive, may with little trouble be brought to become the reverse; such, for instance, as an old stone-quarry, chalk-pit, &c.: these might be converted into rock gardens of more than common interest. Where an imitation at natural rocks is not attempted (and this we would not recommend unless natural circumstances are very favorable, and great taste displayed in the erection,) a rock or Alpine garden may be made very pleasing by merely elevating the borders to a convenient height, and covering them with rude stones, blocks of over-burnt bricks, flints, &c., interspersed with a few specimens of petrifications, rock crystals, spars, &c., or any curious or interesting specimens of mineral substances that may be most conveniently procured, between which the most curious and rare Alpine plants will succeed, if planted in a stratum of soil congenial to their several natures. In planting rock-plants, some attention ought to be paid to the disposing of them, so that such as *Azalia procumbens*, *Dryas octopelala*, and all the *Helianthemum* family should be as much exposed to the sun as possible; while all plants belonging to *Cryptogamia*, such as ferns, mosses, &c., should be placed in the shade. The soil in which most Alpine plants will succeed is generally of the most primitive nature, such as heath or peat-mould, sand, or

decomposed stone, either micaceous or calcareous. A soil composed of half maiden light sandy loam, and half heath or peat earth, will be found to suit nine-tenths of the plants entering into this species of garden. Some few require calcareous matter to grow them in perfection, either chalk or fragments of limestone pounded down, or a portion of lime rubbish, or all mixed with a little light loam, will be as good as any for this purpose.

Others require bog-mould, or entire decayed vegetable matter, to bring them to perfection, such as *Rubus chamaemoris*, *R. articus*, and others, while some seem to exist upon vegetable matter while yet in a state of life; such, for instance, as *Drosera rotundifolia*, *D. longifolia*, &c., which are cultivated, as well as many of the curious plants of the order *Orchideæ*, in masses of moist and living *Sphagnum*. Manure seldom enters into the compositions for growing rock plants; indeed, in general, it is injurious rather than beneficial. A pure, exposed, airy situation, which is kept cool during the excessive heats of summer by the application of plenty of water, copiously given over-head to refresh them, at such times when the sun is off them, and to cool the surrounding air, seems the mode of cultivation most corresponding to their natures. In cultivating a collection of choice Alpine plants, or such as pass under that denomination, it is necessary, for the preservation of each species, that at least one plant or two should be kept in pots; as, when planted out upon the rock, they are in danger of being overrun by their more rambling neighbours, or destroyed by damp in autumn, or excessive cold in winter. To prevent disappointment, and the loss of any valuable species, a collection should be kept in pots, which need not be large; the size known by the name of large sixties will be found sufficient for the greatest portion of them; and a collection so kept has its beauties, when arranged in a neat manner in the rock garden during summer upon a bed formed of finely-sifted coal-ashes, and kept neat and clean; while during winter they ought to be plunged up to the brim almost in the same material, and carefully covered with frames and glasses, so that they may be kept as dry as possible, and frequently examined, to remove all mouldiness, or appearance of damp or decayed leaves. We have cultivated for some years

past extensive collections of these interesting little plants, and found them to succeed to our wishes by adopting the following treatment:—

When the plants begin to vegetate in spring, but not before, they should be examined, and those which are in want of shifting should be separated into two or more pieces, according to the nature of the plant, and each separate piece be potted in a pot of the same size, if it be wished to have the number of the species much increased. Where it is desired to have only a stock sufficient to preserve each species, then instead of potting each piece into which they are divided, we have planted them out on the rock to make up deficiencies; or when they were not wanted for that purpose, we have planted them on the tops of walls, or in other situations agreeing with their respective natures. We do not recommend to shift all the collection at one stated time, all fixed periods for such purposes being radically wrong; plants should only be shifted or repotted when they require it, and not promiscuously, merely because it is spring, summer, or autumn. At a more advanced period of the season they should be gone over again, and divided or propagated, as they require it. When all danger of frost is over in spring, they should be all removed from their winter quarters, and placed on prepared beds of finely-sifted coal-ashes placed closely together. The ground under such covering of ashes should be previously prepared, by being formed of prepared clay, to the depth of a foot or more, and, when finished, a few inches higher at the sides than in the middle, for the purpose of more readily retaining water; for although most Alpine plants require to be kept dry during a great part of the year, still they seem to thrive better when their roots are kept cool, and this is partly attained by keeping the bed upon which they stand rather damp, particularly during the heats of summer. Worms, which are also a great annoyance to all plants in pots, will not so readily reach them, being less fond of living in the strong clay than in richer garden-mould.

Alpine plants, arranged in pots of the same size, and neatly numbered, or their names painted on neat labels, will be rather a pleasing object. Care should be taken in labelling all plants, to adopt labels bearing some proportion to the

plants, the name or number of which they are meant to express. Nothing looks so bad as large, clumsy, badly written or painted labels; and rather than they should be used, it is better to have none at all. During summer, all that is required in their management, is to supply them with plenty of water, mornings and evenings in dry weather, and to examine them carefully in time of excessive sunshine, to give them a little shade during the hottest part of the day; and every measure calculated to render the air round them cool during summer is desirable. They should be often examined during continued rains; and where it appears that from bad draining, or other causes, the water does not pass readily through the ball and pot, they should be turned over, so that the superfluous water may run out, in which position they may remain until dry enough to be repotted, or they may be placed on the top of the other pots for a like purpose. When worms make their appearance in the pots, it is necessary to turn the ball carefully out, and by that means the worms may be got at and destroyed; or they may be watered over-head with lime-water, which, without injuring the tenderest plant, will bring the worms up to the surface, where they will soon expire. Slugs are more destructive to rare plants in pots than worms, and often eat the heart of the plant out before they can be observed; to keep them under, recourse has been had to lime-watering, &c., but we have always found hand-picking the most effectual remedy in all cases where these destructive creatures intrude themselves.

Care should be observed during summer to collect seeds of the rarer species of Alpine annuals or biennials, or such as are found to propagate by that means only. This is the more necessary, as very many of our rarest plants ripen seeds immediately before their dissolution, thereby affording the cultivator the means of perpetuating, or very probably of rearing a new progeny more likely to be of longer duration with us. The change of climate sensibly affects plants which are natives of high latitudes, or great altitudes above the sea, and it is visible in their continuing only a short time with us in a state of perfection; nor is it in the least improbable, that some perennial plants in their native habitats, become biennials, or

even annuals, when brought into our warmer climate, somewhat analogous to plants which are natives of the plains becoming *Viviparous* when found growing in situations much more elevated. On the approach of the autumnal rains, they should be well cleaned and removed into their winter quarters, but not yet plunged in the coal-ashes, the intention of which is the preservation of the pots from expansion by frost, as well as the preservation of the plants.

For the first few weeks they should be exposed constantly to the air by removing the lights entirely, and only keeping them on during the time of rain; but in winter, however, they need not have much air, provided they be kept free from damp and frost. Alpine plants, although natives of regions of great altitude, many of them growing within the limits of perpetual snow, are often found destroyed by the frost of an English winter; and this proves the necessity of covering them not only with glass lights, but in severe weather with mats, in imitation of the natural covering of snow, by which they are protected and kept warm.

Many plants are almost annually imported from different parts of the globe, which are seldom kept alive above a season or two even by the best cultivators. Of these, the families of *Sarracenia*, *Ophrys*, *Habenaria*, *Corallorrhiza*, *Orchis*, and several others, furnish examples. Plants of these families require a peculiar mode of culture, with which cultivators are not yet sufficiently acquainted. The most successful cultivators grow them chiefly in decayed vegetable matter and moss, and depend upon keeping them in a close moist atmosphere, considerably shaded. These, however splendid and curious in their mode of flowering, are not often met with in our flower gardens, which arises from a want of knowledge of their proper culture.

In cultivation, the majority of these plants require the constant protection of a frame and glass, and to be kept moist by frequent waterings. The pots in which they are planted should be large, and packed round with moist moss, or plunged into decayed leaves or woody matter very much decayed, so that the roots may never be exposed to the changes of wet and dry; and the pots used for them should be such

as are used for growing bulbs in, as their roots penetrate to a considerable depth. In situations where they can be planted out in shady woods, choosing dry or damper spots for such species as require it, and protected from accidental injury, a great hope exists of their being naturalized into this country; but many of the species cannot be expected to remain long in existence in our flower gardens.

Near to the Alpine garden, if a situation be naturally favorable, a shaded bank should be made for mosses; and blocks of stone, and stumps of old trees scattered about for the growth of fungi. It is only the want of situation, which should be both damp and shaded, and the limited knowledge which exists of these numerous and extremely beautiful and curious plants, that prevent their cultivation. Few plants, if any, in the vegetable kingdom, are so tenacious of life as the majority of the plants forming the great mass of *musci* or mosses. Being for the most part evergreens, and producing their fruit during winter, they will afford a pleasant study to those attached to botanical pursuits, and only require to be seen to be generally admired. Few attempts have been made in this country to cultivate them, and there is little doubt of the success in situations naturally calculated for them. They thrive best in the most barren soil, and almost always in cold and moist situations. Most of them are perennial and evergreen, and their growth is remarkably slow; three, four, and five months often elapse from the first appearance of many of them till they arrive at perfection.

MONTHLY OPERATIONS
OF THE
FLOWER GARDEN.

JANUARY.

PLANTING ORNAMENTAL TREES AND SHRUBS.

AT this season, few operations can be carried on in this department, at least as far as regards planting, &c., unless the season be unusually mild, and the soil to be operated upon be of a dry, light texture. Strong wet soils should either be planted early in autumn or late in spring. However, when it is intended to plant, the ground may be prepared, if the weather be dry, and all made ready for planting as the season advances. Should it be temperate, and the soil dry, deciduous shrubs and trees may be planted, taking care to keep them as short time as possible out of the ground, in order that the roots may not be exposed to the cutting winds. Tender shrubs and evergreens of every description, should not be planted now, unless under favorable circumstances, but the former in March or November, and the latter in August and September, and April and May, when it will be found that they will succeed much better. However, where mixed shrubberies are to be planted, the spaces for such may be left until the above seasons. With great care, however, evergreens may be removed, even if of a large size, at any season from April to November, but not so successfully during the winter months. The success of transplanting, in all cases, depends much on the length of time which the plants are out of the ground, as well as on their size, and the nature of the soil in which they grow. In cold situations and strong soils, before planting be attempted, it is necessary that the ground be properly drained and trenched, without which, there can be little

hope of success. Where draining may not be necessary, it is of the greatest importance that trenching should not be omitted, however good the soil may be in other respects. Nothing can be more erroneous in practice, although we see it daily done, than to dig a pit for a tree of only sufficient size for the roots, which are thrust in, and a few clods trodden in upon them; pits made on that principle serve as vessels for holding the superfluous water, that may and will collect in them, and the sides being hard, it cannot readily pass off, but remain to stagnate and sour the mould about the roots, which soon perish. Independently of which, the roots being shortened in the operation of taking up, throw out many fine young fibres, which are intended for collecting the future food of the plant. These fibres, after finding their way through the loose mould with which the pit may be filled, and which may have been prepared for the purpose of more readily causing them to emit young roots, find a barrier in the sides of the pit, through which they are unable to penetrate, and so remain confined within the narrow compass of the pit, until the tree, in all probability, decays for want of nourishment; or, where the pits are small, and the plants large, they are blown about, so that their roots never make any effort to extend themselves, and consequently the tree perishes.

The ground being previously trenched, these objections are remedied; a free filtration goes on, and no part of the ground retains more than its just share of moisture; the roots finding no impediment in extending themselves in all directions.

Much also depends on the state of the ground, at the time of planting, as to whether it be too dry or too wet to ensure success; it can scarcely ever be too dry, and never at this season; and should it be too wet from continued rains or melting snow, it is much better to defer planting until it become of a proper texture. At a time when the soil may be termed neither wet nor dry, the operation of planting will be most successfully performed. It is, therefore, improper to plant in a retentive soil in the time of rain, or even perhaps for some days afterwards, or after a fall of snow, until it has for some days disappeared; whereas, on dry sandy soils it may

be proper to plant in the time of gentle showers immediately after heavy rains, or as soon as the snow has disappeared.

At all times, in preparing the pits for plants, they should be made large, whether the ground has been trenched or not, with the view of admitting the fibres and roots of the plants to be spread out to their full length. Much of the success of planting depends on the spreading out of the roots of the plants in a regular manner, and covering them equally with fine earth, which, if the natural soil be not particularly good, where the trees planted are large or valuable, it will be well to procure some fine mould in which to plant them; or, if the soil be good, some pains should be bestowed to break the mould fine with the spade, and to dispose of it in a regular manner over the roots of the plant; and as the mould is regularly filled in, the plant should be pulled gently up and down, or if large, shaken a little, so as to admit of the mould filling up all the spaces between the roots. The mould should also be gently trodden round it with the foot, and the plant set upright, unless when planting to attain certain purposes, when it may be necessary that some of the trees should not stand perpendicularly.

If the plants be large, they should be carefully supported as they are planted with stakes, to prevent them being blown about by the wind. For want of this precaution many plants are lost, for nothing is more injurious to them than being beaten about and loosened at their roots by the wind. It lacerates and breaks the roots; and the friction of the stem on the surrounding mould forms an opening, which will admit either frost or drought to the roots, both of which are extremely injurious to newly-planted trees.

Newly-planted trees of all sizes, even those that are small, should be gone over occasionally after planting, and those placed upright which may have fallen to a side, and the ground round their roots trodden, and all cracks filled up, so as to prevent the access of drought.

Mulching trees has its advantages, and should be more generally attended to than appears to be the case. By mulching is to be understood a laying on of a covering of littery dung, saw-dust, or any other refuse matter capable of resisting the

effects of drought upon the surface round the roots of newly-planted trees. Gardeners mulch with rich dung, when they wish to convey manure to the roots of trees or plants without disturbing the ground round their roots. Liquid manure answers the same purpose. But in the case of mulching shrubs or ornamental trees, where the intention is to keep the mould round their roots moist, and not to manure them; any refuse matter may be used with equal success.

PRUNING.

Hardy trees and shrubs may be pruned, if the weather be not very severe, but with the more delicate, as well as with all evergreens, the operation should be deferred till March. This is an operation too generally neglected; the consequence of which is, the miserable dead-and-alive specimens of shrubs which we so often see, as well as misshapen trees, which, with a little management, might have been very ornamental. All plants and trees, whether cultivated for their fruits or for the beauty of their flowers, require and should have an annual general pruning or arrangement of their branches, and this pruning should be performed more or less, according to the sort of beauty or effect expected from them. Those which are cultivated chiefly on account of their flowers, should in all cases be pruned upon the same general principles as fruit-trees; that is, all wood should be removed that has a tendency to exhaust or weaken the tree or plant by an unnecessary profusion of leaves and branches. Those which are grown chiefly on account of their foliage, should be less pruned, merely taking away all weak shoots, or part of those that are stronger, where they appear too crowded. Those which are cultivated for the beauty of their natural shape or general outline, require little or no pruning, except it may be the removal of those branches which may have been accidentally injured. Of this description are all those trees which stand singly upon the lawn, grass-plats, &c., and all specimens of trees in the arboratum. No one can expect to have fine shrubberies, nor even fine trees, without the use of the pruning-knife, if for no other purpose than the removal of dead and misplaced spray. In pruning

shrubs, we need scarcely caution the most inexperienced novice against the barbarous use of the hedge-shears. The instruments necessary for this purpose, are pruning-knives, saws, and a neat pruning-hook; and the object to be attained is the removal of all ill-placed branches, either where they cross each other to disfigure the tree, or where they obtrude upon other specimens, or come too close to the walks or flower-plats. In their removal, let it be done as by stealth, so that the amputation will not be discovered. It is often necessary also to thin out the heads of trees and shrubs, for the free admission of air into them, as well as to keep them within their prescribed bounds. Some shrubs require an annual pruning, such as roses, which if cut well in, will break much stronger, and flower better; besides, by this mode of regulating them, they will be kept within reasonable bounds, and always have a healthy and young appearance.

Rambling plants, such as *Lonicera*, *Clematis*, and others, require also a regulation of their branches, by removing all the dead wood, and such of the old as can be spared, as well as shortening some of the young shoots well in, to ensure a succession of young vigorous wood to fill up the spaces they may be intended to cover; without which they would become thin, and unsightly at their bottoms.

GRASS-LAWNS, GRASS AND GRAVEL-WALKS.

Grass-lawns and walks should be regularly attended to in open weather, and frequently rolled, polled, and swept; and where worm-casts are troublesome, let the whole be watered with lime-water, applied by the watering-pot, and repeated till all appearance of them is over. Where leaves or other litter may have been blown upon any part of the grass in the pleasure-ground, it should be removed as extremely injurious to it, and if left long upon it, would destroy it entirely. The grass verges of walks should also be swept, and the roller either drawn over them, or else beaten down, with the turf beater.

If the weather be open and mild, those places which may have been injured, or where the turf is bad, or decaying,

should be made good. Turf may now be laid to any extent in the formation of lawns or grass-walks, taking care that it be laid down as soon as possible after it be cut, and not exposed to frost or drying winds. The ground, previously to having the turf laid upon it, either for walks or lawns, should be levelled, and such places as may have been raised with fresh mould should be trodden or beaten down, to prevent it from sinking afterwards.

When the whole is brought to the desired level, it should be well rolled, if the weather be dry enough to admit of that operation; and if the soil be rich on which it is intended to lay the turf, it would be well to lay an inch and a half, or two inches of any light sandy poor mould upon it, to prevent the too rapid growth of the grass afterwards. Great care ought to be paid to procure turf of the finest quality, that from a sheep-walk or down is always to be preferred, as being naturally composed of grasses of habits the least luxuriant. The turf should be cut in lengths of three feet, and one in breadth, and as near to one inch and a half in thickness as possible, and, as they are cut, they should be neatly rolled up, the grass-side inwards, to render them more portable, and less liable to be broken in the carriage.

Where turf of this description is not to be had, it is better to sow down the ground intended for grass with grass-seeds than to use bad turf. The families *Aira*, *Lolium*, *Festuca*, *Cynosurus*, are to be preferred, with a mixture of *Trifolium repens*, avoiding those of the families of *Dactylis*, *Bromus*, *Triticum*, &c., as of too gross a growth, ever to be brought to a fine bottom. It is to be regretted that so little attention is paid to the cultivation of the useful grasses, both in regard to agriculture and gardening. Previously to laying down lawns or walks, either with turf or artificial grass-seeds, it is necessary to have the ground well cleared of noxious weeds, for if not done before they are formed, it cannot be so well done afterwards. When the turf is laid, it should be well beaten two or three times over with the turf-beater, so as to beat the whole into one mass; afterwards, it should be rolled and otherwise managed according to directions, which will be subsequently given.

PLANTING EDGINGS OF BOX, &c.

If the weather be mild and dry, edgings of box, thrift, &c. may be planted. In preparing the ground for box-edgings, it is necessary that it be well trodden or beaten down, and rendered level with the surface of the intended walk. The line should then be stretched upon it, and with a spade a neat even trench should be made six or eight inches deep, turning the earth out to the side next the walk. Against the side of this trench, which should be rather sloping, the box-plants are placed, and kept steady in their place by pressing the back of the hand against them, while, with the other, the earth thrown out in its formation is placed over the roots and against the plants, which keeps them in their proper place and position.

In preparing the plants for planting, let them be moderately divided, and thinned out in form of a fan, the large and woody roots cut off, as well as the tips of the tops, so that, when the plants are planted, the line will appear straight, level, and equal throughout. Let a sufficient quantity of mould be placed to their roots, and the whole afterwards filled up with gravel, and the walk neatly rolled down.

Edgings of thrift, *Statice armeria*, a native of our sea-coasts and highest mountains, is often planted, and while young, looks neat, but, from its rapid growth and short duration, is not so well calculated for edgings as box; it is readily propagated by dividing the plants into pieces; whether they have fibrous roots or not is of little consequence to their growth: they may be planted as already directed for box, or dibbled in at three inches apart.

PROPAGATING HARDY SHRUBS BY CUTTINGS.

Many hardy deciduous shrubs will now succeed by this mode of propagating. The young shoots of last year's growth should invariably be made choice of, and cut into lengths according to the various sizes and kinds; by autumn they will be fit either to plant out into nursery lines, or some of them may be sufficiently strong to plant out permanently in the shrubberies.

PROPAGATING BY LAYERS.

This mode of propagation, although not to be generally recommended, as the plants mostly originated by it are found to grow to trees less handsome than those which are obtained by seeds or cuttings, is still the most expeditious and sure mode for obtaining rooted plants, and is therefore too often practised by cultivators. There are, however, many rare and valuable plants that are found so difficult to propagate by other means, that it is necessary often to adopt it. For many of those plants, this and the three following months are peculiarly adapted

PROTECTING TENDER SHRUBS AND PLANTS.

Great care should now be paid to those shrubs and plants which are of themselves not sufficiently hardy to stand our variable, and often inclement winters, without protection. Supposing that, upon the approach of winter, they have been matted up, or otherwise protected by temporary coverings put over them, as well as their roots protected by laying some dry fronds of fern, straw, or saw-dust over their roots; in fine days the covering which is over their branches should be removed, to allow them to enjoy as much light and air as possible, and such covering should only be again applied on the appearance of severe frosts. Such shrubs and herbaceous plants, as may have been planted in autumn, should be also protected at their roots by spreading litter, fern, or straw over the surface, to prevent the admission of frost, which to them would be extremely injurious, and to many even fatal.

ALPINE AND RARE PLANTS REQUIRING PROTECTION.

The Alpine plants in pots, in frames or pits, or those which are rare and require such protection, should be daily looked over, and all appearance of damp removed. The glasses should be kept constantly on them, unless in fine days, when they may be partially removed. Such plants, while in an

inactive state, will not hurt from being confined under cover, provided they be kept dry; as, in their native habitats, they are covered with snow for several months annually.

FLORISTS' FLOWERS.

Under this head we comprehend tulips, pinks, carnations, auriculas, polyanthuses, anemonies, ranunculuses, hyacinths, &c. The tulip-beds, planted in autumn, should be protected from much wet, as well as from severe frosts; both of which would be very injurious to them. Those pinks and carnations, which are in pots or beds, should also be attended to, and all decayed leaves removed, and the beds protected from too much wet by occasional coverings of canvas or reed-mats, which can be readily applied by having the beds hooped over in a neat and secure manner. Those which are in pots should be protected by being plunged in coal-ashes, or saw-dust, up to their rims, or removed under cover of frames and glasses. Auriculas and polyanthuses require at this time to be also protected from severe cold and heavy rains. It is of material consequence that both, particularly the former, be kept dry, and placed in an airy situation, for, if placed in one which is wet, they are liable to damp off.

PLANTING ANEMONIES, RANUNCULUSES, &c.

Such of these as were not planted in autumn may be now planted, if the ground be dry, and the weather mild; but it is only in very light soils that they will succeed at this time, the proper time of planting being October and November, and in wet heavy soils in February and March: the latter planting will prolong the season of flowering.

PLANTING BULBS.

Various bulbs, such as hyacinths, jonquils, prancratiums, narcissuses, fritillaries, crown imperials, &c., may still be planted in light dry soils, if not planted in October and November; but, in heavy wet soils, it is better to defer planting

till the end of February or March. Crocuses and snow-drops may also be planted, either in beds, arranging the colours, so as to produce effect, if in beds, or they may be planted for temporary edgings, or in patches, of ten or twelve roots each, by the sides of the walks, or under the shade of trees and shrubs, where almost nothing else would grow. The more common kinds of narcissuses, crocuses, and snow-drops, together with Winter Aconite, *Eranthis hyemalis*, *Helleborus nigra*, *H. lividus*, and *H. atro-rubens*, will give relief to the gloom and dead appearance of the grove in winter, and give rise to pleasing associations in the shrubbery. These may be now planted, and if once introduced into the shaded parts of the pleasure-ground, will not readily be lost.

FORCING FLOWERS.

Many flowers may be brought to perfection for the drawing-room, &c., with little trouble or expence at this early part of the season, either forced in pits, or placed in any of the forcing-houses now at work. For this purpose, it is necessary to have a stock potted, or reared in pots in autumn, and protected during winter until such time as they may be wanted. The sorts most generally chosen for this purpose are Cape Jasmine *Gardenia florida*, *G. radicans*, carnations, mignonette, double-flowering peach, double-flowering cherry, pinks, double rockets, violets, *Viola odorata var. pallido plena*, &c.; wall-flower *Cheiranthus Cheiri flora pleno*, &c.; roses of sorts, *Amaryllis* of sorts, hyacinths, Persian and common lilac, narcissus of sorts, *Heliotropium peruvianum*, and many others which are found to perfect their flowers from this time until they expand in the open air.

Many bulbous plants may be flowered to great perfection, particularly hyacinths, narcissuses, and tulips, by placing them upon bulb-glasses, which glasses should be filled with soft-water, and the bulb so placed that their bottoms only should touch the water. These, if placed in any of the forcing-houses at work, or other warm situation, will readily come into bloom. They will soon shoot their roots into the water, which should be changed for them every day.

FEBRUARY.

PLANTING DECIDUOUS SHRUBS AND TREES.

The planting of all deciduous shrubs and trees on light soils should now be finished as fast as possible. But, on soils of a colder nature, they may be planted during the following six weeks with success. Where it is intended to plant largely, it will be well in either case to have all such as are intended to be planted taken up, and laid in by the heels, as it is technically called, so that vegetation may be checked or retarded until it be possible to have them planted. Evergreens should not be planted at this time, unless for particular reasons, as they are found to succeed much better when planted either in August or April, and the beginning of May. However, with care, these may be planted at this time where particularly wanted. At this season it is material that they be kept out of the ground but as short a time as possible, and that their roots be not exposed to frost or to cold cutting winds.

PRUNING SHRUBS AND TREES.

Let the pruning of all shrubs and trees be now finished as soon as possible, that the borders and grounds may be dug or otherwise put in order for the season; and, in performing this operation, it is necessary, in the first place, to cut out all dead or decaying wood, or spray, and to shorten in all the shoots which may have been injured, or not sufficiently ripened, to their extremities. Those shrubs which are naturally disposed to grow bushy or crowded, should be thinned out particularly towards their centre, that the air may more readily circulate among the remaining branches. Roses should be headed down, leaving only a few inches of the last year's wood, which will make them break stronger, and flower more abundantly; besides, hard pruning keeps them neat and within proper bounds, without which they would soon become un-

sightly. Honeysuckles, and such rambling growing shrubs, require also to be well shortened in, unless where they are intended to cover walls or disagreeable objects. In the flower garden and shrubbery, where a dense mass of vegetation is not particularly wanted to hide certain objects, or for the sake of shelter, each shrub should stand detached, and of itself form an agreeable outline. Ornamental trees require little or no pruning, as it is intended to see them assume their natural characters; but those branches which may have been broken or injured during the winter, or those which cross each other in a crowded manner, may be safely removed.

All suckers rising from the bottoms of shrubs should be either destroyed, or, if wanted for propagation, should be removed and planted out to nurse until they be strong enough to be planted out where they are to remain.

DIGGING THE SHRUBBERY AND FLOWER BORDERS.

When the weather is dry, the shrubbery should be dug over in a neat manner, which will greatly encourage the growth of the shrubs, as well as give the whole a more agreeable appearance, and render it much easier to keep it in neat order during the summer by the hoe and rake. It is never necessary to give manure to shrubs; but when the roots of them become so matted and entangled, as to render digging amongst them impracticable, it may be necessary to top dress them with any light mould which is free of weeds; this will greatly encourage their growth, as well as give the borders a neater appearance. In very old shrubberies, digging is unnecessary; all that is required is merely to keep them clear of weeds and decayed leaves, by means of the hoe and rake.

The flower-borders are differently constituted, as they are never allowed, under good management, to become impenetrable to the spade. They require an annual digging, and that must be even carefully performed, for fear of injuring the plants which are under ground, or burying those that are small.

To obviate this, in a great measure, each plant should be furnished with a label, upon which its name should be neatly

printed or written, or numbered, so as to refer to its name in a list. Many, however, object to plants being labeled, as having an appearance not altogether in character with the private flower garden, and where that is the case, stout pegs may be driven into the ground close to each plant, and their tops level with the surface; this will, in a great measure, protect the plants, while the cause is kept concealed. Great care should be taken in putting in the spade that the plants be not injured, and for the better effecting this purpose, a neat three-pronged fork might be used instead of the spade, which will perform the necessary operation without endangering the plants.

GRASS-WALKS AND LAWNS.

Grass-walks and lawns may still be continued to be laid or sown where required. Continue to sweep, poll, and roll grass-walks and lawns, when the weather will permit. The grass-edgings or verges to gravel-walks, and the sides of all grass-walks, as well as the edges round clumps of shrubs or flowers, should be now neatly gone over with the edging iron, and cut as straight as possible. The accompanying figure represents an edging-iron of our invention, which was first published in



the *Gardeners' Magazine*, No. 2, by our permission, and may be purchased of Mr. Ware, at his Agricultural Machine Warehouse, Oxford-Street, price *One Guinea*. In all cases, excepting when there is a long straight line to be edged, a garden-line is unnecessary; where a line must be used, it will perhaps be best to place it so that it will run between the wheel and the coulter, or cutting-part of the machine (*a*); a certain degree of pressure is necessary upon the handle, where

the ground is hard; and the knee'd coulter (*b*) may be used where the edgings are not very regular.

The expedition and accuracy with which a labourer, once accustomed to use it, will go over a piece of ground, is surprising. As the grass will now be beginning to grow, it is necessary to have it cleared of all leaves, or other matter that may have accumulated during the winter, and to be put in neat order for the season.

BOX OR OTHER EDGINGS.

Edgings of box, thrift, &c., may now be planted, or any vacancies in those already planted may be made up. (*See last Month.*)

GRAVEL WALKS.

Keep the gravel-walks free from weeds, moss, and litter of every sort, and let them be often weeded, hoed, raked, and rolled, in dry weather.

SOWING TENDER ANNUAL SEEDS.

Towards the middle of the month prepare a hot-bed of moderate dimensions, on which to sow all kinds of tender annuals, either in large pots plunged in the dung, each having a different sort, or where the number of each may not be required to be so great, two sorts may be sown in one pot, and when sown, each should be correctly labeled; or, if the number required be great, the bed being moulded over, small shallow drills may be made across it for their reception. As some of these seeds are very small, they should not be buried too deep, and the mould in which they are sown should be of a very light and rich nature; that of vegetable mould of decayed tree-leaves should be preferred.

When the plants appear, admit air every day, more or less, according to the weather, and let them be supplied with occasional waterings from a fine rose watering-pot, having the water aired previously to using it. Where only a few of these seeds are to be sown, they may be sown in pots, and

placed in any of the hot-houses now at work, or at the back of any melon or cucumber-frames. When sufficiently strong, they are to be pricked out into small pots, and afterwards encouraged in growth, so that they may attain a larger size before flowering.

SOWING HALF-HARDY ANNUALS.

Half-hardy annuals are such as require to be reared on a slight hot-bed, towards forwarding them for their final plantation in the open borders of the flower garden. They may be sown every way as already directed for tender annuals, but are always sown in greater quantity. When the seeds vegetate, air should be freely admitted, and during fine days the glass may be entirely removed from them, taking care to cover them up at night. If the plants come up too thick, they should be thinned out, so that they may not be injurious to each other.

SOWING HARDY ANNUALS.

Towards the middle or latter end of this month, if the weather be mild, and the ground dry, and of a light and sandy nature, hardy annuals of all sorts may be sown either in beds to be again transplanted, or into the borders, where they are to flower, in patches moderately thin, and not deeply covered. The smaller growing annuals do not succeed so well by being transplanted as those of stronger growth, therefore the former should always be sown in patches, where they are to remain to flower. In sowing them, the ground being previously dug, patches should be stirred up with a small trowel, about a foot broad, breaking the earth well; a small drill should then be drawn in a circle of nine or ten inches diameter, and half an inch deep, into which the seeds should be regularly sown, not too thick, and neatly covered over. As each patch is sown, it is necessary to place a small label in the centre of the circle, with the name of the plant sown, in order to prevent, in future sowings, too many of the same kinds, or too many of the same colours being together, as well as a mark to prevent them from being destroyed in the ope-

ration of hoeing and raking the borders. When the plants have come up an inch or two, they will require to be thinned, particularly the larger growing kinds, to admit of their attaining a good size.

Where the soil is strong and wet, the patches may be formed for the reception of the seeds by placing in each a spadeful or two of fine light sandy mould into which the seeds may be sown.

SOWING PERENNIAL FLOWER SEEDS.

Seeds of hardy perennial flowers may now be sown on a moderate slight hot-bed, in rich light mould, as already directed for annuals. When the plants appear above ground, give air daily and freely, to prevent them being drawn up weak, also let them be moderately thinned out, so that they may attain some strength by the time that the weather will admit of their being pricked out into nursery-beds.

SOWING BIENNIAL FLOWER SEEDS.

Seeds of hardy biennial flowers, may also now be sown either on a slight hot-bed or on a warm border, in light rich soil. The directions already given for perennials are also applicable to these.

PLANTING HERBACEOUS PLANTS.

Herbaceous plants of all sorts may now be planted, if the weather be mild. In planting such, much judgment is necessary, to dispose of the whole so as to produce an agreeable effect when in flower, as well as to arrange them, by which there will be an uninterrupted succession of flower during the season.

FLORISTS' FLOWERS.

The fine auriculas in pots should be gone over; all decayed leaves removed, and the surfaces of the pots gently loosened up, and a little fresh mould applied all over the surface and round the stems. This will support them, and enable them to

bring their flowers to greater perfection. Those which require it, should be shifted into larger pots in a careful manner. All suckers should be removed from the stems and potted, or otherwise disposed of. Water should be now given to them in moderate and regular supplies, and plenty of air admitted to them, if in frames, during the day; but care must be taken to prevent them from exposure to frosts during the night, to prevent the opening blossom from being nipped or injured.

Tulips and hyacinths in beds should be protected from severe frosts and rain, by being covered with canvas or mats, supported upon hoops arched over them; for as the flower-buds will now be beginning to come through the ground, they are in that state more liable to be destroyed. It is, however, unnecessary to protect the less valuable sorts, otherwise than merely by spreading a little dry litter over them in severe weather, but the more choice ones should be carefully protected from continued rains, snow, or severe frost.

Carnations and pinks should be often looked over, and all dead leaves picked off, and every thing removed which tends to produce damp or decay. Those which are in pots should also be attended to, and a watchful eye kept that they do not sustain any injury from slugs or mice, both of which, at this season, are often destructive to them.

SOWING SEEDS OF AURICULAS AND POLYANTHUSES.

Auricula and polyanthus seeds should be now sown either in a warm sheltered spot, or in shallow boxes or pots filled with light rich mould. Boxes and pots are to be preferred, as being more readily removed from one situation to another, as occasion may require. The surface should be made perfectly smooth and level, on which the seeds should be sown tolerably thick, and covered about a quarter of an inch with very light finely-sifted mould. Previously to filling the boxes or pots, it is important that they be well drained at bottom, to allow of all superfluous moisture passing freely off. When sown, they should be placed in a situation perfectly sheltered from the cold winds, but entirely open to the morning and mid-day sun. In this situation they may remain till the be-

ginning of May, when it will be necessary to remove them to some more shaded place. There is not any plant which attracts the florist's attention, that requires more shade than the polyanthus.

TRANSPLANTING CARNATIONS AND PINKS.

In mild weather, transplant those carnation plants, which have been last year propagated from layers, into beds in the flower garden, or into pots, to be afterwards shifted into larger ones as they advance, in the latter of which they should be left to flower; or they may be planted out singly, or in patches, of three plants in each patch, promiscuously through the flower garden or edges of the shrubbery.

Pinks propagated last year should now be also planted out, either in beds in the flower garden, or in patches in different parts of it.

FLOWER GARDEN BORDERS.

Let the flower garden borders or beds be now thoroughly cleared of all weeds, and every kind of litter; for neatness in this department is expected, and always agreeable, and at no season more so than at the present, when the flowers and plants are beginning to appear. The surface of the borders should be neatly and carefully stirred with a hoe, and neatly raked, which will give a liveliness to the surface, and make the whole appear pleasing to the eye.

ALPINE AND OTHER RARE PLANTS IN POTS.

At this season, many of the Alpine, and other rare plants in pots, will now be beginning to show evident signs of vegetation. It is necessary, therefore, that they be carefully examined, and that it be ascertained which of them are dead, that they may be by some means or other made up again. Those which it is desirable to propagate, should now be taken out of their pots, and divided into pieces, according to their several habits, and repotted; and others that may have increased beyond the intended limits of this collection, should be planted out, partly on the rock, or in favorable situations

in the flower borders; keeping only a specimen or two of each in pots, unless it be those which are very minute and liable to be lost, or too rare to be yet trusted out either in the general collection or in the flower borders. Many Alpine plants of great beauty are only annuals, therefore such should be attended to, and the pots in which they grew left undisturbed, as in a short time, it is very probable that a stock of young ones will arise out of them, which is particularly the case with the families *Cochlearia*, *Illecebrum*, *Draba*, &c. Many other families, of which it is necessary to keep duplicates in pots, such as *Dianthus*, and some others, require to be propagated annually either by cuttings or seeds; with such exceptions, the remainder should be annually repotted and divided, and no season is so fit as the present. As they are repotted, they should be replaced in the frames or pits, and protected from heavy rains until they have taken fresh root, after which time the majority of them will be fit to be placed in their summer station, which should always be one that is shaded by walls or pales, but not by any means by trees, unless the plants can be placed sufficiently distant from them to be out of danger of being injured by their dropping.

Seeds of Alpine plants may be sown at this time with every chance of success; and as they are small, they should be sown in finely-sifted mould in pots, and kept in a cool frame, considerably shaded, and regularly supplied with water. In sowing the seeds, they should be scattered rather thin on the mould, to afford them room when they vegetate, so that they may be left to attain a considerable size before removed to single pots, as they are very apt to damp off when potted while too small.

M A R C H.

PLANTING SHRUBS AND ORNAMENTAL TREES.

The planting of all deciduous shrubs and ornamental trees should now be finished as soon as possible, as many of the forward kinds will be beginning to vegetate. In planting in light soils, the roots of trees should be well covered with mud previously to being planted, or, as gardeners term it, mudded in, or well watered immediately afterwards; and those which are of large size should be supported in a neat and secure manner with stakes, to prevent their being blown about by the winds. Evergreens of the *Pinus*, and such like hardy families, may be successfully planted now, but for those evergreens which are of a more delicate nature, the next month is more suitable, particularly if in exposed situations. In shaded or sheltered situations, they may be, with care, planted almost at any day of the year with success; but on a large scale, and where they are not completely sheltered, April and May will be found the better season for spring planting, and August and September for the autumnal.

Where roses are to be planted, either in the borders singly, or in collections, this is a good time for that operation. When planted in the borders, they should occupy the front, or side nearest to the point from which they are to be seen; as the best cultivators of this flower, by training and pruning, keep them within a few inches of the ground, unless for particular purposes, they may be occasionally allowed to grow to a greater height.

Few flowering shrubs require a better soil to produce their flowers in perfection than the rose, although in their wild state most of them are found in sandy poor soils, yet, when cultivated, they can hardly be planted in soils too rich or strong.

Roses planted in collections by themselves, are very interesting; and, in an extensive place, it cannot be considered as

complete without such a collection. To produce the greatest, and probably the most imposing effect, this numerous family should form the furniture as it were of an entire garden. Such gardens have been denominated *rosaries*, and are variously formed, according to the extent of the collection and taste of the planter or owner. In the arrangement of the sorts, they should be so placed, that the varieties which resemble each other may be placed together, in order that their distinctions may be the more readily seen, and only one plant of each variety introduced. The different varieties of China roses should be placed by themselves, that they may be the more readily protected during winter, as many of the finer varieties are not sufficiently hardy to stand our severest winters. That numerous assemblage of roses, denominated Scotch, from their habit of growth are better calculated for covering banks or rock-work, than blending in a general arrangement of this family; they should, therefore, also be planted in a separate compartment by themselves, either as a centre or margin for the whole.

Of this interesting section of this genus, there are above three hundred varieties to be procured in the nursery of Messrs. Austin of Glasgow, who probably have the finest collection in the kingdom. The catalogues of roses in the London nurseries enumerate upwards of five hundred names; and the catalogue of Calvert & Co., near Rouen, exceeds nine hundred: the greater part of these being raised within these thirty years from seeds saved on the continent, where these seeds ripen more frequently than with us. French roses are imported annually by us in large quantities, and are in a great part budded upon stems of stronger growing kinds, from two to ten feet high.

In planting rosaries, those which are considered English roses, or such French ones as are hardy enough to stand our climate without injury, should be planted and trained, by laying annually the branches to within a few inches of the ground, and so managed that the whole surface may be covered with them. The more delicate French roses may be planted as standards amongst the others, and will in such an arrangement have a

good effect; or they may be planted out on the lawn singly, or in lines by the sides of walks.

GRASS WALKS AND LAWNS.

Where grass lawns are to be made of any considerable extent, this is now a good season, and the mode of forming them by sowing is decidedly the most expeditious and economical. In preparing the ground for this purpose, it is necessary to be at some pains in having it thoroughly cleared of root-weeds, which if not done now, cannot be accomplished afterwards without evident injury to the grass. For this purpose, the ground should be carefully dug over and all such roots picked out; it should then be properly levelled and rolled down to a regular and uniform consistency. If the ground be rich, which is thus intended to be laid down, the grasses would be apt to grow too luxuriantly, and be not only difficult to keep, but would also never become of a fine bottom. A thin stratum of sand or light sandy earth should be regularly spread over the whole, as noticed last month; over this a thin stratum of earth of a richer texture should be placed in an even manner, into which the seeds should be regularly sown, and when raked in, be well rolled with a heavy roller. As the spring advances, the new sown lawn should be frequently examined and cleared of all weeds as they appear, and if the grass-seeds have failed, or come up too thin in some places, more seed should be sown as soon as such failures are discovered. Such lawns should be cut several times during the first season, but never too close nor yet in dry weather, as, in that case, the roots would be liable to be parched up by the drought.

Where immediate effect is the object, and where good turf can be procured, the most eligible plan is to cover the whole with turf cut from some down or sheep-walk, where the herbage is fine, as, in a few weeks, the whole may appear as if it had been made for years. This is as a good season for this operation as any, indeed, from September till the beginning of May, provided the operation be performed neither in too dry nor too frosty weather. Such as is laid late in spring should be occasionally supplied with water, until the turf has taken root, if

the season be not unusually wet. The ground, previously to the turf being laid down, should be properly levelled, and if too rich, a thin stratum of fine sand, or light sandy barren mould, should be placed all over it, as already directed. As it is laid down, let it be well beaten with the turf-beater, and, when tolerably dry, repeatedly rolled. During the first season after laying, it should not be too frequently, nor yet too closely cut, as it will be less able to resist the effects of dry weather.

Grass walks are not so frequently met with now as formerly, neither should they be introduced where good gravel can be had, particularly where there is to be much traffic, as they are less calculated to last long in good condition. However, it sometimes occurs that such walks are not to be dispensed with, and, in such cases, they should be formed at once of turf, and not sown down with seeds; and the tougher the turf is, the better they will resist the action of the feet.

GRAVEL WALKS.

Gravel walks should now be put in good order for the season. Where the gravel is still clean and good, they should be rolled once or twice a week, so that the surface may be kept smooth and agreeable to walk upon. Those walks which have been made a long time, and are become dirty upon the surface, as well as those which are liable to be overrun with different species of mosses and other weeds, should be turned; that is, they should be dug over with a spade to the depth of two, three, or four inches, turning that which was the surface into the bottom, and bringing up from that depth a fresh surface; by this means the walks will appear as if they were newly made. Where gravel walks have been washed away during the winter, in a season of heavy rains, or have fallen into holes or inequalities of surface, or which are otherwise out of proper repair, they should be top-dressed with a thin coat of clean good gravel, and well rolled down.

In forming new gravel walks it is important that they be rendered perfectly dry at bottom, by having a formation of from one to two feet of brick-bats, flints, small stones, or such like matter, over which the gravel is to be placed. Such pre-

paration is necessary in all situations, however dry; but in wet ones it will also be necessary, in order to render them still more dry, to have a drain in the middle of each, below the stratum of flint, stones, &c., which drains should empty themselves at convenient distances, in such a way as the water which they may collect may be carried off to a distance, or disposed of so that it may not be injurious to any part of the garden.

Those gravel walks which may have been ridged up in autumn should now be levelled down, and put in order for the season. We have advised this mode of ridging up the gravel for the walks in the Culinary Garden, for the greater preservation of them during winter, when the gravel would be liable to be injured by wheeling, and such like operations that might require to be done in that department; but as there will be fewer of these operations going on in the flower garden or pleasure ground; and as the walks, while in such a state, would be unsightly, and rendered unfit for use, we would not advise that operation to be performed in this instance. Indeed, the walks throughout the flower garden and pleasure ground should be kept equally well during the winter as during the summer. As the gravel is turned over, or fresh gravel added, it should be rolled as the process goes on, for gravel seldom binds so well after rolling, if that operation be deferred until it becomes either dry or exposed to rain.

DIGGING THE FLOWER BORDERS AND SHRUBBERY.

Every part of the flower garden and shrubbery should now be put into the best order. The flower borders and shrubberies should be finished digging if deferred so long. Previously to digging or pointing over these borders, all edgings, whether box or turf, should be neatly and evenly cut, the former with the box-edging shears, and the latter with the edging-iron. Those borders which have been dug over in autumn, or during the winter, should be frequently hoed and raked over to give the whole a more cheerful and respectable appearance.

PLANTING BOX AND OTHER EDGINGS.

Box and other edgings may be now planted or repaired when the weather is fine ; if dry, give occasional waterings until they have struck root.

PLANTING HERBACEOUS PLANTS.

All sorts of herbaceous plants may now be planted, either to fill up vacancies in the flower borders already planted, or to plant such as are in process of making. More attention should be paid to the arrangement of these plants, as far as regards colors, than seems to have been hitherto practised, as well as the keeping up a succession of these flowers for the greatest possible length of time. The beauty of a border of gay flowers does not consist so much in the quantity of bloom as in the manner in which that bloom is disposed of, so that harmony of coloring may prevail throughout the whole.

SOWING TENDER ANNUALS.

If these were not sown as directed last month, let them now be sown without delay, either in large pots plunged in a mild bottom heat, or in drills in fine rich light mould, as directed last month. Plants now raised from seed will bloom beautifully in June, July, &c., till the end of the season, and will come in very useful for decorating the green-house when the plants are out in their summer station, as well as the conservatory and drawing-room, during these months.

PRICKING OUT TENDER ANNUALS.

Such tender annuals as were sown last month, and are now fit for being removed into nursing pots, should be attended to. Make choice of the strongest plants, which should be taken up carefully out of the pots into which they have been sown, and pricked off into small pots, one plant into each, if of the size called *Thumbs* or *Thimble* pots ; or three plants may be placed into each, if in such as are of the size of small *sixties*, these to

be afterwards transplanted into larger pots as they advance in growth. To have these plants fine, it is necessary that they be grown rapidly, and great care must be taken that they do not receive a check in their growth, which would be apt to throw them into flower at a premature state, when their flowers would not attain so large a size, nor yet blow so fine. Throughout the whole culture of tender annuals, they should be prevented from being drawn up slender, which will be the case if kept too far from the glass; for this purpose nothing is so well adapted for their reception, after their being once potted-off, as a hot-bed frame of the ordinary dimensions, so that the plants may be allowed to enjoy plenty of light, and be near the glass, while their roots are plunged into a mild bottom heat. While in this bed they should be regularly supplied with water, and often sprinkled over their leaves, and air daily admitted to them.

SOWING HALF-HARDY ANNUALS.

Half-hardy annuals comprehend all such as require to be forwarded in a mild heat, and gradually hardened till they are sufficiently established, and the season mild enough to admit of them being planted out in the borders of the flower garden, either in large patches by themselves, or singly amongst the other plants. To this division of annuals belong by far the most splendid and curious; and as they can be cultivated in the open air during summer, after having attained a certain size, a large portion of each seed should be sown when compared with those under the last head.

SOWING HARDY ANNUALS.

Hardy annuals of all sorts may now be sown in the open borders, where they are to remain to flower. In sowing these, the dwarf ones, such as *Convolvulus minor*, *Anagallis Indica*, *Mignonette*, &c., should be sown in front of the border, while the various varieties of lupins, larkspurs, &c., occupy the middle, and sweet peas, sun-flowers, and such as are equally tall, should be placed nearest the back, that is, the farthest from the walk. They should be sown, each kind separate, in patches of ten or

twelve inches in diameter ; and some kinds, such as mignonette, may be sown in larger patches, while sweet peas may be sown in lines to hide disagreeable objects, for which they are admirably calculated ; and by being neatly staked up, will have a showy and gay appearance.

In order to fill up vacancies, as well as to plant in such places that may at present be filled with bulbs or other spring flowers, a considerable sowing of hardy annuals should be made in the reserve garden (a very necessary appendage to every flower garden), from which a supply can be taken when wanted to plant in the borders ; and as many of these plants are improved by being transplanted, such as lupins, sun-flowers, and other strong growing kinds, they will be rather improved by this mode of culture than otherwise. A sowing of many of these sorts should be made towards the end of this month, and another in April, for the purpose of rearing plants to come in, in succession, and to last till destroyed by the autumnal frosts.

TRANSPLANTING ANNUALS SOWN IN AUTUMN.

Many annuals sown in autumn are found, with a little protection to withstand the winter, and when that is the case they come into flower much earlier in spring, than such as are sown even upon a hot bed, and they also flower much finer. Of these, that beautiful plant *Coreopsis tinctoria* is a striking example, although only introduced a very few years from its native wilds in the Arkansa territory, in North America ; it is now become very common in our gardens.

Plants self-sown in autumn, and either potted off into small pots and protected in a dry airy frame during the winter, or pricked out into shallow boxes under the same protection, will be in good order at this time for finally planting out in the flower borders, where they will attain the height of four or five feet, and be covered with flowers from the ground upwards. Mignonette, by the same mode of culture, will also be found to succeed well, and will come into flower long before that which was sown in spring.

SOWING HARDY PERENNIAL AND BIENNIAL FLOWER SEEDS.

All kinds of hardy perennial and biennial flower seeds may be sown towards the middle or end of this month. As these plants do not flower the same season in which their seeds are sown, it is therefore unnecessary, at this time, to prepare a hot-bed for them; the proper situation for them being the reserve garden, where a piece of rich light ground should be got ready for their reception by being well dug, and divided into beds according to the number and quantity intended to be sown. The ground being prepared, the seeds of each sort should be sown thinly and regularly, either in beds or in drills; and as they are sown, let them be covered to the depth of half an inch and correctly labeled.

ALPINE AND OTHER RARE PLANTS IN POTS.

The potting of the Alpine, and other rare plants, in pots or frames, should now be finished; and after they are again sufficiently established in the pots, they should be placed out in their summer station. There are, however, many which will require the shade and close air of the frame or pit during summer, both for shelter and shade, particularly the latter; of these are most of the natural order *Orchideæ*, many *Ferns*, and some other families, such as *Sarracenia*, *Drosera*, &c.; these should be kept in a close frame during the summer, plunged in a thick mass of sphagnum or other mosses, and kept damp by often watering them over head with a moderately fine rose watering pot. By far the greater portion of Alpine plants will succeed well in pots of the sizes called large sixties or small and large forty-eights, in a soil composed of one half of light sandy loam, and half bog or peat mould, occasionally using a little fine white sand or mould of decomposed leaves. During the summer they should be placed in a situation as little exposed to the sun as possible, but not by any means under the drip of trees, on a bed prepared for them of finely-sifted coal ashes, as already noticed. As the great object of a shaded situation is to give them the advantage of a cool and equitable atmosphere; this will be increased by frequent watering over head

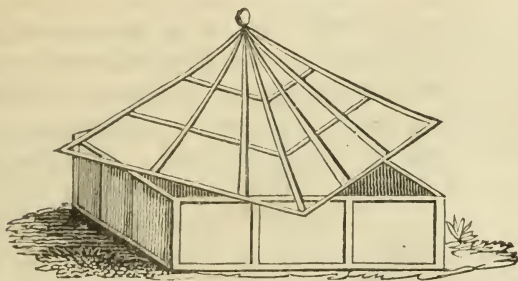
with a fine rose watering-pot; but this can only be done with safety, either early in the morning or late in the afternoon. When such a practice renders the mould in the pots too damp, (a thing to be guarded against in spring and autumn, but during the warm months of summer, evaporation will go on so rapidly, and the plants being in small pots exposed all round to the action of air, will not be injured by it,) water may then be given amongst the pots, so as to keep the bed on which they stand always cool and rather damp. By a similar practice we have been enabled to cultivate Alpine plants on an extensive scale, and the result has been entirely to our satisfaction.

Alpine plants are often planted out on rock-works and in shaded borders. Professor Thouin arranged a bank of Alpines in the Paris garden, an account of which he published in the *Annales de Musée*, and a translation of which has been published by a celebrated English botanist in the *Trans. Hort. Soc.* The plants on this bank did not succeed to expectation; and daily experience shows that plants of this description never thrive well, nor long, in beds or banks of any kind. The practice of potting appears, therefore, to be the best mode; and although attended with a little more trouble and expence, the lovers of these curious and interesting portions of the vegetable creation will be repaid by having many of Nature's smallest, and not less perfect treasures, in a state of perfection equal to their native habitats.

FLORISTS' FLOWERS.

Auriculas.—The auriculas, in pots, should now be gone over, and all decayed leaves removed; the surface of the mould in the pots loosened and partly removed, and a top-dressing of fresh mould given them. They should, if in a frame or auricula stage, be frequently, although moderately supplied with water and exposed to gentle showers; but care must still be taken that they be not suffered to become too wet. Air must be freely and daily given them; and when it is wished to have them flower strong and in full perfection, only one flower-stem should be allowed to each plant, all others should be rubbed off as they appear. Seeds of good auriculas should now be

sown in a box of fine light earth, and thinly covered, as the seeds are apt to lie dormant or rot when sown too deep. The box should be placed in a warm sheltered spot, and carefully defended from heavy rains. As the plants advance they will be readily conveyed from one situation to another in boxes or large pans, until they become sufficiently strong to be permanently potted off. These plants naturally, as well as the whole *Primula* family, enjoy the shade; care must therefore be taken, throughout their whole culture, not to expose them for any length of time to the scorching rays of the sun. Auricula seeds will vegetate more quickly, if placed on a little bottom heat, but as soon as they are sufficiently above ground they should be removed to a warm sheltered spot in the open air, for, by this means, they will be forwarded a little, and in cold wet springs and unfavourable situations, it is necessary; but in situations naturally warm, and in good seasons, they will not only come stronger, but a greater number of the seeds will vegetate, if sown in the open air or with the occasional protection of a hand glass; and the best sort of glass is that which has the top or upper part separate from the lower, as in the annexed figure.



Polyanthuses, in pots, will require the same mode of treatment as has been already recommended for auriculas, and seeds of them may also now be sown. As the common parent of the numerous varieties of pol anthus is a native of our sunny banks and warm sheltered fields, it is more hardy than its associate the auricula, whose common parent graces similar situations in Switzerland. A warm shaded border of light soil, moderately enriched with rotten manure, having a northern exposure, will

therefore be found a suitable place for them; or they may, in unfavourable situations, be sown in shallow boxes or pans, and placed in a situation where they can be shaded from the mid-day sun.

Carnations.—Carnations raised from layers and pipings last season, should now be potted off into full-sized pots, in which they are to perfect the flowers. These pots should be not less than one foot in diameter at top. The roots of this plant are subject to injury from excessive damp; therefore the pots should be well drained for them, and a sufficient quantity of mould prepared for potting them. Like all other plants which come under the above denomination, or which have attracted the attention of the florist, many soils have been recommended; and, as in most other cases, each individual estimates his preparation as the best.

We will subjoin the soils used by two respectable florists, as they have themselves published them, and as they appear rational and free of that quackery which is so much practised in compositions for florists' flowers.

Mr. Hogg of Paddington, notoriously known as a first-rate cultivator of the carnation, gives the following as his practice:—

“ Three barrows of loam, one and a half ditto of garden mould, ten ditto of horse-dung, one ditto of coarse sand; let these be mixed and thrown together in a heap or ridge, and turned two or three times in the winter, particularly in frosty weather, that it may be well incorporated. On a dry day towards the end of November, I take a barrow of fresh lime, which, as soon as it is slacked, I strew over it while hot, in turning the heap; this accelerates the rotting of the fibrous particles in the loam, lightens the soil, and destroys the grubs, worms, and slugs. Lime is too well known as a manure to say any thing farther in its praise here. If there has been much rain during the winter, so that the strength of the compost is reduced, and the salts washed from it, I take about seven pounds of damaged salt, and add them to it, either dissolved in water or strewed over it with the hand. This, from an experience of three years, I have found to be attended with the most beneficial effects upon the future health and vigour of the plants.

During very heavy rains many florists cover the compost with tarpauling or double mats to prevent the nitrous particles from being washed out. This is also an excellent precaution. If any objection be started that the quantity of dung is too great in proportion to the loam, I answer that such an objection might be well founded, if the compost were to be used immediately on its being mixed together; but as it has to lie six months before it is used, I am decidedly of opinion that the quantity is not more than is necessary in order to ensure a luxuriant growth and generous bloom."

Mr. Maddock, an equally successful and well-known florist, gives the following as his practice:—

"One half rotten horse-dung, one year old, or that which has been used for a hot-bed for cucumbers, melons, &c.; one-third sound loamy earth, one-sixth coarse sea or river sand. These ingredients are to be mixed together in autumn, laid in a heap about two feet thick, in an open exposure, and turned two or three times during winter; or otherwise, the dung alone, after being used as a hot-bed, may be thrown together in a heap, in a conical form, in order to rot more perfectly; and as its surface freezes in winter, it should be pared off and laid on one side till the whole mass has been completely frozen throughout. This may be repeated as often as the season permits, and it will be completely fit for use the following spring. The earth and sand may be added to it in March, when wanted to fresh pot the plants for bloom. The whole should be well mixed and incorporated, and passed through a coarse screen or sieve to reduce its parts and take out stones or any other extraneous substance which it may contain. In country places, where the air is more pure, experience has pointed out the propriety of using less dung and more loam. The proportions of which, for such situations, may be reversed, viz.: one-half loamy earth and one-third dung, with the sand as before specified. The preparation of the compost, in other respects, is to be exactly the same in all situations."

The pots and mould being prepared, the plants should be carefully taken out of the small pots in which they have stood the winter, or if they have not been potted, taken carefully out of the bed, into which they may have been pricked out last

season as soon as they were fully rooted and separated from the parent plant. Let them be now placed in the pots already noticed, and gently watered as soon as potted; when a sufficient number are potted, let them be placed in an airy dry situation, and defended in wet weather by mats or canvas covers, where they will remain until taken into the greenhouse, or placed upon a flower-stand to bloom. All that will be now necessary in their culture till their flowers begin to open, or until the season of propagation arrives, will be to keep them regularly watered, and their flower-stems neatly supported by sticks to prevent them being broken.

Those which may not be considered sufficiently valuable for potting, may be now planted out in the borders of the flower garden, where they will come into flower in good perfection; and those which are considered border flowers, picotées, &c., should now be planted out in the borders of the flower garden, either singly, or in patches of three or four plants each, or they may be planted with good effect in beds, according to the size, style, &c. of the garden.

Pinks.—The pinks propagated last year should now also be planted out. The fine flowering kinds are generally planted in a bed or border by themselves, and protected from heavy rains, winds, &c., by occasional covering with mats, canvas, &c., supported by hooped rods placed over the beds. The pink, although also of British origin as well as the carnation, is much less tender and less choice in its situation and soil. Maddock, already mentioned, considers a soil as follows, all that is necessary in this part to produce fine pinks

“A good fresh loamy soil dug and comminuted about two feet deep, and manured with a stratum of cow-dung two years old, mixed with an equal proportion of earth.” This stratum to be about six inches thick, and placed about five or six inches below the surface.

PLANTING RANUNCULUSES AND ANEMONIES.

The planting of these roots should now be finished as early in the month as possible; and if the ground be dry, let them be occasionally supplied with water in a moderate degree.

HYACINTHS.

The hyacinths in beds or patches in the borders, will now, if the weather has been mild, begin to make their appearance. Those which are in beds, and may be considered fine, should be protected from occasional frosts, and also from too much rain. As the shoots advance, let them be neatly supported with sticks, as they are apt to be broken if left unsupported, the flower-spikes, if large and double, being heavy. They should also be protected from accidental injury, by being hooped over in a neat and secure manner, and occasionally covered with canvas, or Dutch reed, or garden-mats.

PROPAGATING VARIOUS KINDS OF GREEN-HOUSE PLANTS FOR
PLANTING OUT IN THE FLOWER BORDERS.

Many kinds of exotics are of rapid growth, and produce their flowers in a state of greater perfection when planted out during summer into the borders of the flower garden, than if confined within the narrow limits of flower pots. Of these may be enumerated the *Senecio elegans*, which sometimes comes double from seeds, but is most generally propagated by cuttings; *Salvia splendens*, a plant of unusual splendour, introduced in 1823, from the Brazils; *Salvia Mexicana*, a species of the same family, and affording a beautiful contrast in its blue flowers with the bright scarlet flowers of *Salvia splendens*; *Heliotropium Peruvianum*, a plant of considerable beauty and great fragrance; many species and varieties of *Pelargonium*, particularly those with scarlet flowers; and of that numerous and interesting genus *Mesembryanthemum*.

There are many species of the latter which flower profusely during summer, when planted out in light sandy soils fully exposed to the sun, or upon rock-work, where they will continue to flower till destroyed by the frosts. *Hememris urticifolia* and *H. coccinia*, are plants well suited for similar purposes. Cuttings of all these should now be put in, and forwarded with all possible speed, so that they may be fit for planting out in the open borders by the middle of May. Where circumstances will admit of it, it is a good practice to strike a

number of these and similar plants in autumn. With little attention during winter, they will be fit to pot off in March, and if placed afterwards in close frames, with a slight heat, will attain greater perfection by the season of planting out.

Fuschias, *Hydrangeas*, and some other exotics, should be annually propagated in quantities for this purpose, but these seldom flower so well till the second year of their growth; whereas the former kinds produce their finest flowers the first season when properly treated.

PLANTING FERRARIAS.

The *Ferraria pavonia* is a plant of great beauty and of easy culture, and would be one of the greatest ornaments of our gardens, were the flowers less fugacious, their duration being only for a few hours. This apparent defect is amply remedied by planting them in masses, where a succession of flowers will be produced for a considerable time. The bulbs of this plant should be potted in small pots in February or March, and placed in a close frame, where they should continue until they be fit to plant out, which will be by the middle of May. They can then be readily turned out of the pots with the balls entire, and will produce their flowers in July, August, and September. As the plants advance in growth, they should be supported with neat sticks, as they are liable to be broken when exposed to rain and winds. At the natural season when the bulbs are ripe, which, as in the case of all bulbous plants, will be indicated by the decay of the leaves, they should be taken up, and kept in a dry place till their season of planting arrives. A correspondent in the Hort. Trans., recommends that a portion of the mould in which they grow, should be allowed to adhere to them, which will prevent their being too much dried up, while in an inactive state. The same end may be attained by packing them in boxes of sand. They increase rapidly by offsets, and may be purchased from the London nurserymen at five pounds per hundred.

ON THE CULTIVATION OF CORIOPSIS TINCTORIA AND SIMILAR ANNUALS.

There are many annuals which may be brought into flower much earlier in the season, and be much improved in size and the perfection of their flowers, by being sown in the latter end of summer, and protected during winter under frames, &c.; of this sort is the *Coriopsis tinctoria*, lately introduced into this country, and now cultivated in almost every garden. The whole of the varieties of *Cheiranthus annus*, or ten-week stocks, *Viola tricolor*, with its endless varieties; *Iberis umbellata*, *Lathyrus adorata*, *Delphinium ajacis*, *Centaurea cyanus*, and many others; where these have stood the winter, towards the end of this month, or beginning of the next, they should be planted out where they are to remain in the flower borders. The ten-week stocks and *Coriopsis* will be considerably forwarded and improved, if potted into small pots, and kept under the shelter of a frame until they have attained the height of five or six inches, and until the weather has become somewhat mild.

PROPAGATING VARIOUS DOUBLE FLOWERS.

Double flowers are the pride of the florist, but are regarded by the botanist as vegetable monsters, produced by luxuriance of nourishment. Many of them have long been esteemed flower garden plants, and as the chance of producing them from seeds is so uncertain, the gardener has recourse to a prolongation of the plants by cuttings to increase or continue his stock.

Most herbaceous plants, with double flowers, are readily propagated by cuttings, whether they be annuals, biennials, or perennials, and the season of propagating them by such is in spring before the flower-stalks are too far advanced, and in autumn before the flowers are beginning to fade. Some, however, are not so readily propagated as others, of this the double rocket, *Hesperis matronalis*, furnishes an example. Of this plant there are two varieties, differing in the color of their flowers, the one being white, and the other purple.

The most rational directions for its cultivation which we have met with, appears in a communication to the Cal. Hort. Soc., by Mr. D. Robertson, of which the following is the chief detail: "After the flower is beginning to fade, cut down the stalks, and cut them into ordinary lengths of cuttings. Next cut off the leaves and smooth the ends, then make three slits with a knife in the bark or rind longitudinally, so as to separate or raise the bark for half an inch in length. When the cutting is inserted in the ground, the loose bark naturally curls up, and it is from this bark that the young roots proceed. The partial separation and the turning up of the bark seem to promote a tendency to throw out roots. The cuttings may be put into flower-pots, for the more readily protecting them during winter, or they may be planted in the natural earth, provided that it be light and fresh. Covering them with a hand-glass will forward their rooting, and placing them on a slight hot-bed will forward their growth considerably. By this method, stock-julyflowers and double wall-flowers may also be readily propagated."

Annual plants, to a certain extent, may be propagated on the same principle, and their existence prolonged for several years; by a somewhat similar process, double carnations, pinks, &c., have been long propagated, as well as by laying. There are, however, some double flowers which are not capable of being increased this way; of such are those with bulbous and tuberous roots, but as they increase so readily by those means, this circumstance is less to be regretted.

A P R I L.

PLANTING DECIDUOUS TREES AND SHRUBS.

The planting of all deciduous trees and shrubs should be finished the first or second week in the month. In early seasons, this operation should be finished in March, unless the trees intended to be planted have been taken up and laid in by *the heels*, which will check their growth sufficiently to warrant their being finally planted out at this time.

PLANTING EVERGREEN SHRUBS.

This month and August are the two seasons in which these shrubs are found generally to succeed best after planting. The reason assigned by planters why these seasons are more suitable than any other is, that if they be planted early in spring, or during winter, they lie dormant till this time, and while in that state, their best and tenderest fibrous roots are injured, and not unfrequently perish. They are also exposed to injury while in the act of removal, by having their tender roots injured by frost, or cold cutting winds, to which their roots are more liable than those of deciduous trees or shrubs. By planting them at this season, they are less liable to these evils; besides, at this time evergreens are beginning to push out into shoots, which is always the most reasonable time for transplanting any tree, although, as stated above, deciduous trees are less sensibly affected by transplanting than such as are evergreen. Add to this, that about the end of April and the beginning of May, we have frequently warm showers, which, to shrubs of this description, are extremely beneficial, and are always much better for vegetation than water, however well it may be artificially applied. The reasons assigned for planting in August or September are, that they have made their shoots, and, if carefully done, will make fresh roots, and become tolerably established before

winter. At that season we have often genial showers, which to them is of the utmost importance. Experience proves these seasons to be the best for transplanting these plants; and upon an extensive scale, and in exposed situations, we would advise the adoption of it. At the same time, circumstances may warrant their removal at almost any day in the year. Evergreens are extremely fond of shelter and shade, and it is probably the want of these that is the principal cause of the failure of these plants, when removed at seasons when there is a long continuance of cutting winds without any rain. In our practice at Stratton Park we planted fifty thousand evergreens in one season, beginning in November and ending in February; the soil for the most part was of a strong clayey nature, and by no means favorable for plants in general, still the success here was complete, inasmuch as out of that number not two hundred plants died. Most of the plants were brought a distance of twenty miles, and were from two to three feet high. We attribute the success in this instance to the shade which the plants enjoyed in summer, and the shelter during the first winter after planting; as they were planted partly in very old plantations and partly in young ones, in both cases well sheltered and shaded. Evergreens, particularly laurels, may be removed for particular purposes at almost any day in the year, provided that they are taken up with good balls, and shaded, sheltered, and frequently supplied with water over the head as well as at the roots. Evergreens, as well as deciduous trees, of any reasonable size, may be removed, by being carefully taken up with good balls, and immediately planted on the spot in strong baskets. In this way they may be sent to a great distance with safety. In planting them, the pit should be made sufficiently capacious to hold the ball still inclosed in the basket, the materials of which it is composed will soon decay, and instead of preventing the escape of the roots will considerably tend to their nourishment, as in a few months they will be converted into vegetable mould. It not unfrequently happens, that fine specimens of evergreens, as well as deciduous shrubs, may be wanted for particular purposes, and at seasons when it might not be convenient to remove them in the ordinary way. To

meet such demands, it is well to have a stock of such plants as are peculiarly interesting either in their flowers or general habits in a portable state. At this season, therefore, evergreens for this purpose should be potted into large pots, and those of greater sizes planted into strong rough boxes, and plunged in the reserve-garden, or any convenient part of the shrubbery. When they are wanted, they can be taken up and plunged in such situations as their presence will decorate; and if neatly plunged, will appear as if planted for years. It is impossible to urge sufficiently the necessity of having plants in a portable state, so much being capable of being done by adopting that method. A few fine specimens of plants, capable of being removed at pleasure, will afford sufficient opportunity of changing the character of a considerable sized garden as often as the proprietor chooses.

The species of evergreens which are best calculated for removal at unusual seasons, are the common and Portugal laurel, *Aucuba*, evergreen privet, *Rhododendron*, *Daphne*, hollies, yew, and laurestinus. The success of all planting depends a good deal upon the length of time the plants are out of the earth, and no doubt often on the size of the plant. For extensive plantations, or large shrubberies, the plants should be rather small than otherwise; but for smaller plantations, and where immediate effect is required, evergreen trees and shrubs of considerable size may be made use of, and if properly taken up, planted, and frequently watered during the first season after planting, their success will be complete.

PLANTING BOX EDGINGS.

This is a good time for making new plantations of box edgings, or for repairing such as may be in want of it. The plants will succeed almost equally well whether rooted or put in as cuttings, by splitting the old plants into small pieces, and planting them about two inches apart with a dibble. Rooted plants should be laid, and not dibbled, in order that the roots may be properly placed in the ground.

CUTTING BOX EDGINGS.

Box edgings should now be cut where they require it, as all danger from frost will now be past, and the edgings may be put in proper order before the borders and walks are dressed up for the summer. In cutting these edgings, they should be done as neatly as possible, and be of an equal height and breadth throughout, and should not be allowed to exceed three inches in height and two in breadth at bottom, tapering upwards to a point. Nothing looks worse than misshapen box edging, particularly when allowed to attain a large size. The only real use of an edging of any kind is to separate the gravel of the walk from the mould in the border, and an edging of the above dimensions is sufficient for that purpose; larger ones only harbour vermin, and give the garden a neglected and careless appearance.

GRAVEL WALKS.

Gravel walks will now require to be regularly hoed, raked, weeded, and rolled, and kept in a neat and orderly manner during the summer.

GRASS WALKS AND LAWNS.

Grass walks and lawns will require to be regularly swept, rolled, and mown, from this time till November.

SOWING HARDY ANNUALS.

Annuals of this description may still be sown in the flower garden borders, where they are to remain to flower; and a few may be sown in the reserve garden, to be transplanted in May and June, to fill up vacancies where they occur.

SOWING TENDER ANNUALS.

Tender annuals should be sown again this month to succeed those which were sown last month; about the middle of

the month will be a good time: however, if this were neglected to be done last month, let it now be done without delay. Those which were sown last month, or earlier in the season, will require to be forwarded by being pricked out, and afterwards shifted into larger pots as they advance, and a regular brisk heat kept up, either by renewing the linings or making up fresh hot-beds for them, so that they may sustain no check in their growth. It is a rule, which should never be lost sight of, that, in the growing of tender annuals, particularly such as balsams, cockscombs, and globe amaranthus, the nearer the plants are kept to the glass the better; by which means they will not become drawn up weak and flower in a premature state. While the plants are in this state, let them have moderate supplies of water, with the chill taken off, as often as they may require it, all over-head, and let air be admitted daily, in such quantities as the state of the weather will permit. As the plants advance in height, so as to touch the glass, let the frames be lifted up a few inches at a time; and this practice should be followed as often as they may require it. The soil in which tender annuals should be grown, should be as rich and light as possible; indeed, balsams and some others are brought to their greatest perfection in entirely rotten dung; good light mould, enriched with rotten dung, and frequently watered with liquid manure, will bring these plants to great perfection, if they be allowed sufficient pot-room, and regularly shifted.

SOWING AND PRICKING OUT HALF-HARDY ANNUALS.

Many half-hardy annuals may still be sown upon a slight hot-bed, and many of such as were sown last month may now, if the weather be mild, be planted out in the borders of the flower garden; the more tender sorts may be pricked out in a nursing-bed, covered with a frame and glasses. They will attain a good size, and be fit for final planting out by the end of the month or the beginning of May. The more tender kinds of these plants should be, when fit, pricked out singly into small pots, and kept in a little bottom-heat till the end of the month, when they may be planted out with safety: of

these are palma-christi, tobacco; zinnia, several species; Indian corn, gourds, and some others.

FLORISTS' FLOWERS.—RANUNCULUSES AND ANEMONIES.

The more valuable varieties of ranunculuses and anemonies will now be coming into bloom, and, if planted in beds, can be readily protected from the effects of cold cutting winds and frosts, which would be liable to injure them materially, by covering them with hoops and canvas. This covering should also be permitted to remain on them during the hours of strong sun-shine; which, if not prevented, would, after they come into flower, tend in a short time to bring on decay in the flowers. But, if they be screened from all these occasionally, it will not only preserve the beauty of their flowers, but will continue them longer in bloom.

HYACINTHS.

Hyacinths in beds will now be coming into perfection; the flower-stalks should be neatly supported with small sticks, to prevent their heavy heads of flowers from being broken. They will also require to be protected, as already directed for ranunculuses and anemonies.

CRITERION OF A FINE DOUBLE HYACINTH.

Florists, by common consent, have established amongst themselves certain properties of which particular flowers should be possessed, with the view of rendering them select. The properties of a fine double hyacinth should, according to their criticism, have the stem tall, strong, and erect, supporting a number of large bells or distinct *corollas*, each bell supported by a short and strong foot-stalk, standing in a horizontal position, so that the whole may have a compact pyramidal form with the crown or uppermost flower, and be perfectly erect. Each separate flower should be large, and completely double; that is, well filled with broad bold *petals*, appearing to the eye rather convex than flat or hollow. The flowers should

occupy about one-half of the length of the stem. The colors should be clear and bright, of whatever colour they may be ; those which are of a strong bright colour are preferred.

TULIPS.

These will also now be coming into flower, and they should be supported, as they advance, with small neat sticks, and covered both from the bad effects of frost, heavy rains, winds, &c., as well as from the noon-day's sun, which, if allowed to shine upon them for any length of time, would tend considerably to destroy the color and hasten the decay of the flower.

CRITERION OF A FINE VARIEGATED LATE TULIP.

Florists have agreed that a fine late tulip should have the stem strong, elastic, and erect, about thirty inches high above the surface of the bed. The flower should be large, consisting of six *petals*, which should proceed at first a little horizontally, and then turn upwards, forming almost a perfect cup, with a round bottom, rather widest at the top. The three outside petals should be rather larger than the three inside ones, and broader at their base. The petals should not be notched nor serrated, but perfectly entire at their edges. The top of each petal should be broad and well rounded. The ground color of the flower at the bottom should be clear yellow or white, and the rich colored stripes, which are the principal ornament of a fine tulip, should be regular, bold, and distinct on the margin, and terminate in finely-broken points, elegantly feathered or pencilled. The centre of each petal should contain one or more bold blotches or stripes, intermixed with small portions of the original color, abruptly broken into many irregular obtuse points. It is the opinion of some florists, that the central stripes or blotches do not add to the beauty or elegance of the tulip, unless confined to a narrow stripe exactly down the centre, and that they should be perfectly free from any remains of the original color. Such flowers appear very beautiful and delicate, especially where they have a regular narrow feathering at the edge ; but

the greatest connoisseurs agree that it denotes the greatest merit where the tulip abounds with rich coloring, distributed in a distinct and regular manner throughout the flower, except at the bottom of the cup, where it should be a clear bright white or yellow, free from stain or tinge.

AURICULAS.

Auriculas will now be coming into bloom, and will require particular attention, that they may not be injured by dashing rains or cutting winds; for this purpose, they should be protected in frames, and covered with glasses occasionally, and placed so that they may be the least exposed to the rays of the sun; or, if such a situation be not to be conveniently met with, they may be shaded with mats or canvas, from eight or nine in the morning till three or four in the afternoon, in sunny days, and at all times carefully protected from much wet, as the farinaceous matter upon the petals, which adds so much to the beauty of these flowers, will be much injured, if not entirely washed off, by rain. They will require to be carefully supplied with water at their roots during the period of their flowering, but not over-head, for the reason above stated. Those who are high in the fancy of this flower, have stages made on purpose for them, and so constructed, that the plants are at the same time protected from rains, wind, and too much sun-shine.

CRITERION OF A FINE AURICULA.

An auricula, to be of the first rank in the estimation of the florist, should have the flower-stem sufficiently tall to elevate the truss of bloom a little above the foliage, so that it may be seen to greater advantage; it should, at the same time, be elastic, upright, and strong. The foot-stalks of the flowers should be also strong, elastic, and of a length corresponding to the number and size of the pips, which should not be less than seven in number. The pip is composed of the tub, with its *anthers* and *stamens*, the eye, and the outer circle, containing the ground color, with its edge or margin. These

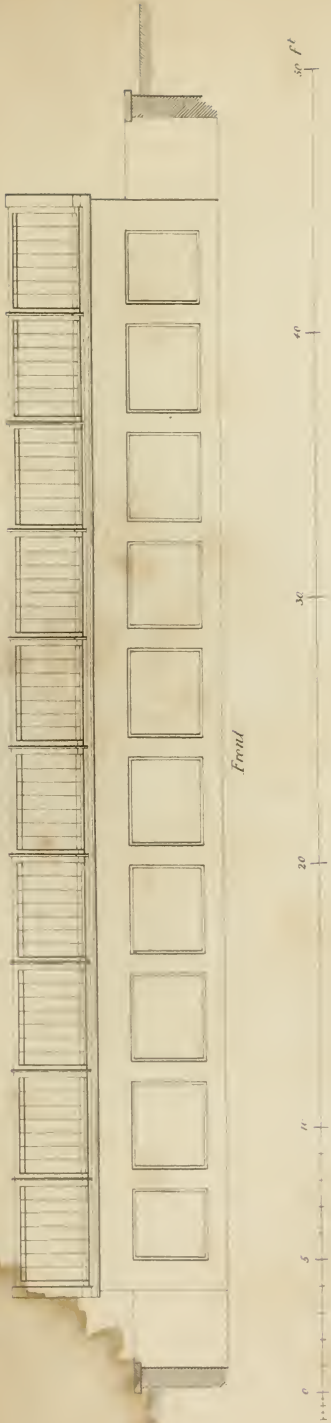
BLACK TAMBOURIN

From a drawing by J. Smith, Esq.

Painted by J. W. Smith

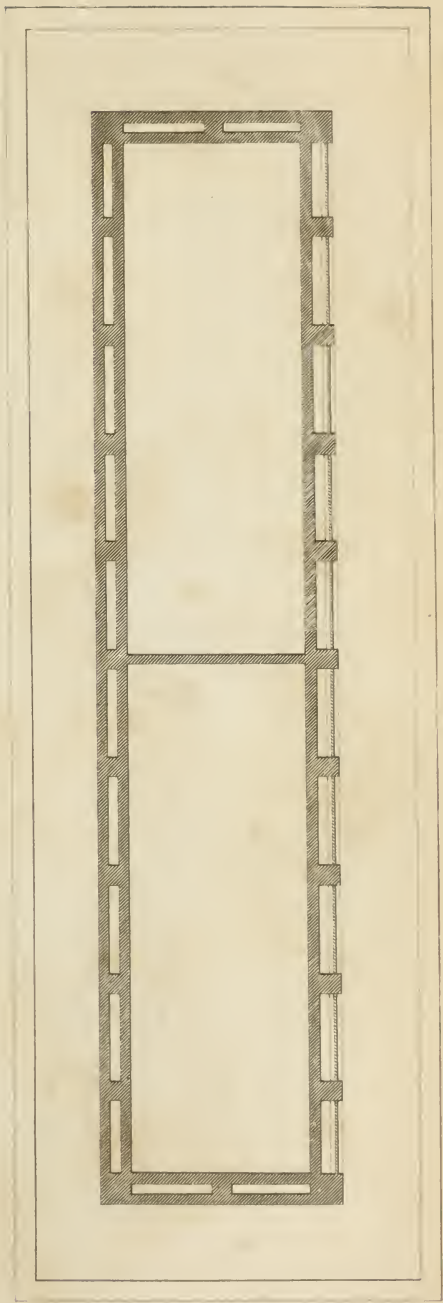


Quarantine Ship



Front

Plan





three should be all well proportioned, which will be the case if the diameter of the tub be one part, the eye three parts, and the whole pip six, or nearly so. Amateurs say that the pips should be round, but as this seldom happens, they content themselves when they nearly exhibit that figure. The summits of the *stamens* ought to be large, bold, and fill the tub well; the latter should terminate rather above the eye, which should be smooth, round, and without cracks, of a fine white colour, and distinct from the ground colour: this should be equal on every side of the eye, whether it be in one uniform circle, or in bright patches, and should be bold and rich, perfectly distinct at the eye, and broken only at the outward part of the edging. A dark or black purple, or bright coffee colour, contrasts best with the eye; a bright pink or rich blue is pleasing; but that which would be most desirable, in this point, would be a glowing scarlet or deep crimson, if edged with bright green; but this they seldom expect. The principal cause of the variegation in this flower is the green margin, and, in proportion to the size of the ground colour, it should be about one-half. The dark grounds of these flowers are for the most part covered, less or more, with a white mealy or farinaceous powder, which florists consider as a natural provision to protect the flowers from the scorching effects of the rays of the sun; white, of all colours, being the greatest non-conductor of heat.

CARNATIONS.

Carnations potted last month, should be supplied with water as they may require, and the pots kept clear of weeds. The plants should also be protected from heavy rains and cold cutting winds, by being occasionally covered with canvas supported on hoops, or kept in frames, and in bad weather covered with lights. If the pots be plunged in ashes, or decayed tanner's bark, the plants will require less water, as evaporation will proceed less rapidly than if the pots stood exposed on all sides

PROPAGATING HERBACEOUS PLANTS.

Herbaceous plants may now be propagated by being divided at the roots; indeed, at this time, this is necessary, to a certain extent, to all of these plants. If they be left undivided, or not otherwise reduced in size, they will transgress the bounds prescribed for them, and some rapid growing sorts will overrun some of those that are of less rapid growth. Plants of this description, like all other plants, exhaust the soil upon which they grow, and in time, the spot where the plant was originally planted, will cease to support it. As they decay in the centre, they will extend themselves in circumference, and become unsightly, and will not produce their flowers so fine, nor yet in such abundance, as if frequently transplanted. In digging and dressing the flower borders, this should be attended to; and, as the operation proceeds, the plants should be reduced to a moderate size, and the parts taken off, planted out either in the reserve garden, or to fill up any vacancies in the borders, or to extend them if desired. Where they may not be wanted for any of these purposes, they should be planted out in the woods in favorable situations, so as to be seen from the walks or drives; and when established there, cannot fail to produce a pleasing effect, which is produced at a trifling expense.

PLANTING DAHLIAS.

Towards the middle of the month, dahlia roots may be planted in the flower garden borders, where they are to remain to perfect their flowers. As the varieties, and consequently the colours of these plants are now numerous, some taste is necessary in the arrangement of them at planting, so that a pleasing harmony of colours may be produced. Some cultivators plant them in rows by the side of walks or borders, and this is probably the best method when a collection is planted for the purpose of proving the varieties; and it will have an interesting effect when in bloom, provided the colours follow each other in tasteful gradation. But to produce a general effect, they should either be planted promiscuously through

the flower garden singly, or in groups, in number and size proportionate to the magnitude of the garden. In either case, attention should be paid to a proper mixture of colours. Mr. Sabine, in Hort. Trans. says, " Dahlias look best in a large mass, unmixed with other plants. In this plan of growing them, some nicety is required in the due distribution of the sorts, so as to have a proper and good mixture of colours; and particular care is necessary to keep the tallest plants either in the centre or at the back of the clump, accordingly as it is designed to be viewed from one side only, or on all sides, and to place the whole so that there shall be no unevenness in the general shape of the entire mass, arising from the irregular arrangement of the individual plants according to their respective heights. The roots should be planted about three feet from each other every way. This distance will keep each sufficiently distinct, and yet so united, that the whole clump will have the appearance of an unbroken wood or forest of dahlias." He also admits that they may be planted in lines by the sides of walks, for the purpose of forming avenues with a good effect.

Dahlias are impatient of much cold, and the first frosts of autumn destroy them for a season, often while in their prime, being natives of Mexico, whence they were introduced into Europe in 1789. The first plants which were introduced were lost, and in 1804 they were a second time imported by Lady Holland, and first cultivated in her ladyship's garden at Kensington. To obviate this, or rather to elongate their period of flowering, has occupied the attention of gardeners for some years. No doubt, soil and situation are favorable in some instances, and their season of blooming will be from the beginning of June till November; but by far the more general time of their flowering does not begin before the end of July, and often the middle of August.

Cultivators have justly endeavoured to bring them into flower at as early a period as possible; and this being once attained, they will continue to flower till destroyed by the frost. For this purpose, they plant the roots in large pots in March and April, and place them in any hot-house at work, on the floor, paths, or indeed almost in any situation of it. When the

plants have attained the height of nine or twelve inches, which will soon be the case, they are placed in a colder situation, and so gradually hardened, that by the end of April or the beginning of May, they are fit to plant out, where they are to remain to flower.

At this planting out, they are carefully turned out of the pots, without disturbing their roots but as little as possible, and planted into the natural ground.

Dahlias will grow and prosper well in almost any soil, although a light sandy loam or soft sandy soil that is not rich, will produce the most handsome plants. In strong rich soils they are apt to grow too rambling and gross, and in such cases produce fewer flowers, and such flowers are much later in the season of appearing.

It is desirable to have the plants small, and to effect this, some cultivators have succeeded by growing them in large pots, boxes, and tubs; others, to effect the same end, have beaten the ground, while moist, round where the roots are planted, so as to render it as solid as possible, and impenetrable to the roots; others have adopted a species of training, which they commence when the plants are about two feet high, by bending the shoots down to within three inches of the ground, where they are held by hooked pegs; and as they advance in growth they are pegged down, so that when in flower they may be of any height required. This is only practicable where they are grown in clumps or masses, and the shoots so managed that the bare stems may be covered as much as possible.

As the shoots of such as are allowed to grow upright advance, they should be carefully and regularly supported with neat sticks, and fastened to them as they advance; for their growth being rapid, and their whole frame tender, are liable to be broken by wind, heavy rains, and many other accidents.

PROPAGATING DAHLIAS.

We may attribute the great variety of these plants, as well as their appearing in almost every cottage garden, as much to the facility of their propagation as to the real merits of their

flowers. Few plants are more readily propagated, by almost every mode, than the dahlia. By seeds they are increased, both in number and variety, with the greatest ease. The seeds ripen with us in most seasons; each flower producing, as is the case with most plants of the class *Syngenesia*, a number of perfect seeds.

The seeds are collected in September, by which time, in most seasons, many of them will be ripe. The preference should be given to seeds from dwarf plants, where the object is not to have varieties of the taller sorts; and seeds from semi-double flowers are more likely to produce double varieties than those of single ones. Opinions have been offered, that seeds from such florets of the disc which may have altered their form, may be more apt to produce double flowers, than such as may have retained their original form.

The seeds should be sown by the first of April upon a slight hot-bed, and when up, and sufficiently strong, potted into small pots, where they should remain in a gentle heat till the first of May, when they may be gradually hardened by exposure, to be fit for planting out in the open ground by the end of that month, where many of them will produce their flowers the same season. Those which may then be judged of sufficient merit, may be taken up in autumn, and the less valuable thrown away.

By cuttings of the young shoots, dahlias may be propagated freely, and by this means produce tubers and flowers the same year. By dividing the roots, they may also be propagated; and this operation will be safest performed after the roots have been potted and in a brisk heat for a few days. When vegetation becomes excited, the rudiments of the young shoots will be observed bursting through the crown of the roots; at such time, with a knife, divide the roots into as many parts as convenient, without injuring the tubers; each piece having a bud or young shoot springing from its crown, will be a perfect plant, and may be either repotted or planted out in the open ground.

By grafting: dahlias may be propagated by this operation as well as most strong-growing herbaceous plants having solid stems; although this species of propagation be new with us,

it has been long practised on the continent. The operation is thus detailed by a correspondent in the Hort. Trans. :—
“The cutting intended for the graft should be strong and short-jointed, having on it two or more joints or buds. It must also be procured as soon in the season as possible; when obtained, select a good tuber of a single sort, taking especial care that it has no eyes: with a sharp knife, (for a dull edge would mangle the fleshy root, make it jagged, and so prevent a complete adhesion,) cut off a slice from the upper part of the root, making at the bottom of the part so cut a ledge whereon to rest the graft. This is recommended because you cannot tongue the graft as you do a wood-shoot, and the ledge is useful in keeping the cutting fixed in its place while you tie it. Next cut the scion sloping, to fit, and cut it so that a joint may be at the bottom of it to rest on the aforesaid ledge: a union may be effected without the ledge, providing the graft can be well fixed to the tuber, but the work will not then be so neat. It is of advantage, although not absolutely necessary, that a joint should be at the bottom of a scion, for the scion will occasionally put forth new roots from that lower joint: the stem is formed from the upper joint. I therefore,” he adds, “procure the cuttings with the two lower joints as near together as possible. After the graft has been tied, a piece of fine clay, such as is used for common grafting, must be placed round it; then pot the root in fine mould, in a pot of such a size as will bury the graft half-way in the mould; place the pot on a little heat in front of a cucumber or melon-bed. A striking-glass may be placed over the whole, or not, with little difference of effect. In about three weeks, the root should be shifted into a larger pot, if it be too soon to plant it in the border, which will probably be the case; for, supposing the work was begun in March, the plant cannot go out till the end of May, so that the shifting will be essential to promote its growth till the proper season of planting out arrive.”

PLANTING OUT CHRYSANTHEMUMS.

The different varieties of *Chrysanthemum Indicum*, since their general introduction into our flower gardens, have added

a degree of splendor to that department, and that at a season when few other plants are in flower. They are highly prized by the Chinese, who are supposed to be in possession of upwards of fifty varieties of this plant. To the Horticultural Society we are principally indebted for many of the most splendid varieties with which our gardens are decorated. This plant early attracted the notice of that society, who have spared no trouble to bring together nearly forty pretty distinct varieties. The facility with which it is propagated, and being a plant almost sufficiently hardy to stand our winters with little protection, renders it the more valuable, as every one who is in possession of a small garden may indulge in the cultivation of it. At this time, plants originated from cuttings the preceding season should be shifted into larger pots, preparatory to their being placed in their summer situation; and such plants as may be of greater age should be also shifted at this time. The superabundant plants, or the earlier flowering kinds, may now be planted out in the open ground; many of them in favorable situations will flower in the open borders, and most of the varieties will flower, if trained to a southern wall. In such a way they have a handsome appearance, and in this way they have been successfully cultivated in the Chiswick garden. Where the intention is to reserve them for the green-house, conservatory, or drawing-room, in the months of November and December, when few other plants are in flower, they should now, when shifted, be plunged in finely-sifted coal-ashes in a warm and dry situation, where, during summer, they will only require to be neatly supported with sticks, accordingly as they extend in size, and be liberally supplied with water at their roots. Their flower-buds will here form in October, when they should be taken into a green-house, or other similar shelter, before the evenings become frosty, where they will perfect their flowers, so as to be fit to be removed to decorate the conservatory or drawing-room. By this mode of culture the plants will become large, and although profusely covered with flowers, may not be so convenient for the latter purpose, as if they were smaller. Cultivators, therefore, vary their modes of growing them, to suit the purpose for which they may be intended; and as this plant is of docile habits and rapid growth, a variety of ways have been tried to produce bloom upon small

plants. The Chinese, who are particularly fond of this plant, manage to flower them in a much smaller state, and in smaller pots than we are in the habit of seeing them. To attain this, they propagate them from cuttings, which they take off in May, and when rooted, pot them into small pots, in which they flower the following autumn. By this method, they manage to produce plants clothed with foliage, from the pot up to the flowers, which they have of a large size, by not allowing more than from three to five to remain on each plant. In this, and a liberal application of liquid manure, consist the whole of their culture.

We have observed in some of the London nurseries, a plan adopted which has the result of producing neat little plants with plenty of bloom, which in itself is as simple and complete as that of the Chinese; but the plants are not *all* so handsome as those by the preceding method. For this purpose, the plants are plunged out in the open borders where they are fully exposed to the sun, and continue to grow till the beginning of September, when the shoots that have shown flower-buds are bent down, and laid in the common manner into pots, of the sizes called large sixties or small forty-eights, where in a short time the shoots send out roots at the part laid in the small pots; and when these roots are sufficiently formed to support the young plant, they are disengaged from the parent, and after being tied up and cleaned, are removed into frames or pits, where they are shaded for a few days, and attended to with water, &c. They soon establish themselves, and perfect their flowers, when they are removed into the green-house or drawing-room. Such plants are from a foot to eighteen inches high, and produce from four to six fully perfected flowers. The buds which have naturally been formed are not all allowed to remain on, but, like the Chinese gardeners, they take them off, leaving only three, four, five, or six, accordingly as the plant may have rooted.

Liquid manure is given occasionally, to enable the plant to perfect fully its flowers.

Chrysanthemums planted out in the open borders, do not require to be ever taken up, unless the soil and situation be damp and uncongenial; and, in such cases, it is better to propagate annually by cuttings, for stock for future use, than to

hazard their surviving the winter. In dry and favorable situations the hardier sorts will stand our ordinary winters, with a slight covering of dry litter, coal-ashes, or such like, placed over them in the beginning of December, and removed by the beginning of March.

Chrysanthemums do not readily come into flower by artificial means, like many other plants, neither do they withstand any degree of frost. The only means, therefore, we have of prolonging their season of flowering, is by protecting them under glass. They will, if kept free of damp, continue to flower till Christmas. Neither do they perfect seeds with us, otherwise their varieties would soon become as numerous as that of the dahlia, and other popular flowers.

PLANTING LOBELIAS.

The whole family of *Lobelia* are peculiarly interesting, although the majority of them are plants of humble growth. The species most generally cultivated as flower garden plants are *L. cardinalis*, *L. fulgens*, *L. splendens*, and *L. siphilitica*. The first of these has long been an esteemed flower in our gardens; the second and third species are of modern introduction, but the splendor of their flowers has entitled them to a place in almost every garden; the last species is rather an old inhabitant of our gardens, and differs from the others in having blue flowers. The whole family are very readily propagated either by seeds, suckers, or cuttings. The seeds should be sown in pots soon after they are ripe, and as they are very minute, should not be covered with mould. The mould in which all the species, particularly the kinds above-mentioned, succeed best, is peat or bog-mould. Before the seeds vegetate, and while the plants are young, they require to be kept moderately damp; but after the plants have attained a considerable size, they cannot then be over-watered. Indeed, they may be grown on the margin of a pond or river to great perfection; and in such situations, when immersed under water, they are found to stand our winters, whereas, if left unprotected when planted in the flower borders, they generally perish.

The season of propagating them by suckers, begins about the first of October, that is, immediately after the plants have done flowering; at which time they send up from the old roots a great many suckers. These young plants being taken off, are potted into small pots, and preserved under frames till the spring, when they are planted out, where they are to remain to flower. We have often practised the following mode of protecting and propagating these splendid plants. In autumn, before the first approach of frost, the old plants are taken up, with a considerable portion of the surrounding mould attached to them, together with all the suckers or young plants. These are carried into an open shed, and placed upon shelves, where during the winter they are kept sufficiently moist by occasional waterings, so as to keep the plants alive; but care must be taken that they become not either too dry nor too moist. During frost, they are protected sufficiently by being covered with mats and straw. In spring they are taken out, and the young suckers taken off and potted into large sixties, and placed in a cold frame; here they remain until fit for planting out. When it is not convenient to pot the whole stock of them, they may remain in the shade, and be occasionally watered and kept clear of damp, until the proper season for their being separated and planted out. The shelves in this shed were fitted up similarly to the shelves in Oldacre's mushroom-house, and fronted the south. The roof being slated, it was perfectly free of damp. In this way we preserved many plants which would not stand our winters without some protection.

Mr. Sabine, in the London Hort. Soc., Vol. II. p. 400, details the practice of Mr. Hedges, late gardener to Lord Mansfield, at Caen Wood, who managed to cultivate the *Lobelia fulgens* in a way which produced plants and flowers of an astonishing size and splendor. "In October he takes off the suckers from the old plants in the usual way, and puts them into small pots, one in each pot, and keeps them in a cold frame till the middle of January. He then removes them into a cucumber-frame, where the heat is kept up to 65° of Fahrenheit's scale, by linings of hot dung. A pine succession-stove of the same temperature, will equally suit them. In the middle of February they are shifted into pots a size larger,

and at the end of March or beginning of April they are again moved into larger pots, and in the middle of May they are a third time shifted; the pots to be used for this last shifting are twelves. As soon as the plants are well rooted, after the last removal, they are carried into a peach-house or greenhouse, in which they continue till they flower, and are hardy enough to bear the open air. When they are preparing to throw up their flowering stems, and during their growth, it is necessary that they be kept very moist, which is effected by putting pans under the pots, and keeping them constantly filled with water. The plants so managed begin to flower early in July, and the spikes continue to grow and are covered with flowers through the autumn. The compost used in the pots is formed of equal parts of brown or yellow loam, and of leaf or bog-mould; to which is added sand, equal to one-fourth of the previous composition, the whole being well incorporated." A plant cultivated in the above manner was exhibited to the society, which attracted universal notice; and another, which was grown in the Caen Wood garden, measured nearly six inches in circumference at the base of the stem, and the height of the centre spike of flowers was five feet and a half.

The hardy *Lobelias* naturally throw up but one spike of flowers, but if this spike be stopped while young, a number will issue from the root; and although they seldom attain so great a height, are much more elegant in their appearance, and seem more vigorous, and produce a greater number of flowers. *Lobelias*, in the flower borders, are often considerably checked in their growth in dry seasons: whether they be cultivated in pots or planted out, it is material that they be abundantly supplied with water.

M A Y.

PLANTING EVERGREEN SHRUBS.

Evergreens of all kinds may be planted any time during this month with success. If the weather be not showery, it will be necessary to water them both at their roots, and also over their heads, two or three times a week, with the garden-engine; and if the ground above their roots be covered with long littery dung, or other similar matter, to resist the drought, a great saving of watering will be attained. The shoots and leaves should never be allowed to become dry or parched either by the sharp winds, which we often have at this season, or powerful sunshine, which would be equally injurious to them at this period, when they have not yet struck root into the ground. Water is the principal food of plants; and if bountifully supplied to newly-planted trees, will greatly assist them in their re-establishment.

SOWING HARDY ANNUALS.

All kinds of hardy annuals may still be sown, both where it is intended that they are to remain to flower, and also on beds in the reserve garden, to be afterwards transplanted into the flower borders.

Those which were sown in March and April, should now be thinned, where they may have been too thickly sown, to a moderate and regular distance, according to the size and habit of growth of the plants. If the weather be showery, take advantage of it for this purpose, but if the weather be dry, let them be moderately watered after thinning, to settle the mould round the roots of the remaining plants, and forward their growth.

Those annuals which are of climbing habits, should be provided with supports to which to attach themselves, when they stand singly in the borders of the flower garden. Such sup-

ports may be made of wire-work in the form of cones, pyramids, &c., and of heights suited to the plants intended to cover them, or branches of trees may be made use of, to which such plants as do not naturally attach themselves should be trained. Those which are not of climbing habits, but which from their slender growth require support, should be trained to neat sticks or pieces of strong wire; which latter, if painted green, and annually collected in autumn and placed in the tool-house, will last for many years. For small and slender plants they are admirably suited, as they are sufficiently strong to support the plants, while from their size and colour they are not readily seen.

PLANTING HARDY ANNUALS.

Hardy annuals should now be transplanted from the beds upon which they were sown last month into the borders of the flower garden, where they are to remain to perfect their flowers. Take advantage of a showery day for this operation, or if not, let them be frequently watered, until they have taken fresh root.

SOWING TENDER ANNUALS.

Tender annuals for a succession to those already raised, may be sown by the beginning of this month. Of these, the principal are *balsams*, *globe amaranthus*, and *cockscombs*, which will prolong the season of those flowers by coming into bloom when those already sown are decaying.

MANAGEMENT OF TENDER ANNUALS.

Tender annuals, sown in March or the beginning of April, will now have attained a considerable size; and to have them in perfection, they will require repeated shifting into pots, increasing also in size. In shifting them from one pot to another, care should be taken not to break the balls or injure their roots, as any check to them will be apt to start them into flower in a premature state. They should be kept in a

steady temperature of 60° to 65°, and plentifully supplied with water, and placed as near the glass in the frames as possible, to prevent them from being drawn up slender. The mould in which they should be planted should be light, and of the richest nature. The dung of an old cucumber-bed reduced to mould, so as to pass freely through a coarse sieve, and having lain for twelve months at least fully exposed to the action of the weather, and repeatedly turned, will of itself be sufficient to grow tender annuals in, until they have attained nearly their full size, at which time they should be shifted, for the last time, into full-sized pots; and to such rotten dung should be added one-third of rich maiden loam, which will afford additional support to the plants during their flowering state, and will tend to cause them not only to bloom stronger, but also to retain their flower much longer. During their whole growth, they should be frequently watered with liquid manure at their roots, and allowed plenty of room in the frames, so that they may branch fully out on all sides. As these plants are of short duration, it is necessary to have successional crops coming on; and, in order to have a constant supply, it will be necessary to sow in February, March, April, May, and June: each sowing to be in pots; and as soon as the plants are making their *rough* leaves, they should be potted into pots of the size called small sixties, and placed into a hot-bed, on a stratum of saw-dust or rotten tan, as near the glass as may be judged safe at that early period. When the plants have made some progress, and nearly filled the pots with their roots, they should be carefully shifted into small forty-eights, and again placed near the glass in the frames, and a brisk growing heat kept up to them. In this way they should be kept growing until their final shifting into pots of sizes corresponding to the respective size of the different species of plants cultivated; *balsams* requiring pots ten or twelve inches in diameter; *cocks-combs*, pots eight or nine inches, &c. During their whole culture, air should be freely admitted to them when the weather will permit of it; and as the plants advance in height too near the glass, the frames should be lifted up.

TRANSPLANT SEEDLING PERENNIAL AND BIENNIAL PLANTS.

Perennial and biennial seeds sown last month, or in March, will now be ready to transplant or prick out into nursery-beds in the reserve flower garden, there to attain sufficient strength to fit them for being finally planted out for good. The most convenient mode of cultivating these, is to prick them out in beds four feet wide, and place the plants about six inches apart each way. After they are planted, they should be shaded both from drying winds and powerful sun-shine, and liberally supplied with water as they may require it. These are to remain here till autumn, when they may be planted out in the flower borders.

SOWING BIENNIAL AND PERENNIAL FLOWER SEEDS.

Such of these seeds as were not sown before, should be sown as early this month as convenient, that they may attain a sufficient size to be planted out early in autumn.

PROPAGATING HERBACEOUS PLANTS BY CUTTINGS.

Many of the more delicate herbaceous plants are propagated by cuttings of the young shoots, particularly those sorts that are not readily increased by dividing their roots; as these plants advance, their propagation should be attended to. A shaded situation in the reserve garden will be found the most convenient place for this purpose. When the operation of propagation is to be carried to a considerable extent, narrow beds should be prepared for the purpose, of light sandy peat, or light sandy loam, and some of pure white sand, to the depth of from three to nine inches, according to the size of the cuttings to be used. These beds should be of the breadth of the garden hand-glasses, which should be placed over them as soon as the cuttings are planted, and kept carefully shaded until they have all struck root; when they may be either planted out into nursery-beds, or otherwise, according to circumstances.

PROPAGATING HERBACEOUS PLANTS BY DIVIDING
THEIR ROOTS.

Many of the more rare herbaceous plants, which do not readily perfect seeds in this country, or are short-lived with us, may be prolonged by dividing their roots, either by making cuttings of the stronger roots of some species, or by dividing the roots, having a portion of their crowns or the rudiments of the stalks attached to them. In either case, they should be carefully separated and planted in a bed prepared as above for cuttings, and covered with a hand-glass until they have taken root.

FLORISTS' FLOWERS.—CARNATIONS IN POTS.

As the stalks of the carnations in pots advance, they should be neatly and securely supported, by being tied to neat sticks, or wire rods, to prevent their flower-stem from being broken. The mould in the pots should be occasionally stirred upon the surface, and part of it removed, and a fresh surfacing of mould applied. They should be regularly supplied with water every evening; and where it is intended to have a few fine large flowers, all those which issue from the side-stalks should be displaced. The plants should be shaded from the full sun either with mats, or placed in a situation sufficiently shaded, but by no means under the shade or drip of trees.

CARNATIONS IN THE FLOWER BORDERS.

As the flower-stalks advance, they should be supported with neat sticks, to prevent their being broken, and the surface often stirred up with the hoe and rake round them, which will encourage the production of strong grass, and afford additional strength to the flower-stems. In dry weather, they should be occasionally watered, according to the state of the weather. Some recommend thinning out the flower-buds of the border carnations, with a view to have the remaining ones finer; but if the ground has been properly made for them, and if they be at this time frequently watered, we see little reason for this

operation. The plants, if strong, and if the border has been well made, and watered in dry weather, will produce abundance of good flowers, and for a long period.

PINKS IN BEDS.

The finer pinks in beds will require to be refreshed with water in dry weather, and have their flower-stems neatly tied up as they advance. Those who are ambitious of fine flowers, seldom allow more than two or three flowers to remain upon each stalk. The surface of the beds should be frequently stirred up; and if it should sink, so as to leave the plants exposed to the drought, a little fresh mould should be laid upon the surface, which will greatly strengthen the plants.

AURICULAS IN POTS.

The fine auricula plants in pots, which will now have done flowering, should be removed from the stage, or out of the frame where they perfected their flowers, and be placed upon a dry airy spot, where they may enjoy the morning sun only till nine or ten o'clock. In such a situation they should remain till the middle of September.

During summer, the pots, and the ground on which they stand, should be kept clear of weeds, and all decayed leaves taken off as they appear. Where offsets are strong, they may be now disengaged from the parent plant, and planted in a shaded border till September, when they should be taken up and potted.

Let the plants in pots be supplied once a day with water in dry weather, and also care be taken that they be not injured by too much wet, particularly in wet seasons, or towards the end of summer; for although the auricula requires a considerable portion of water during summer, still it is impatient of too much moisture both in autumn and spring.

POLYANTHUSES IN POTS.

The directions given for auriculas are also applicable to polyanthuses; they are much seldomer found in pots, generally succeeding perfectly when planted out in a shady border.

HYACINTHS IN BEDS.

The hyacinths which may still be in flower, should be protected, by being covered as directed last month, and those which are past flowering should be taken up. But this should not be done until the leaves become withered and yellow, and begin to decay. A dry day should be chosen for taking up those roots; and as they are taken up they should be placed upon mats, or some dry clean place, to dry and harden. In the course of a fortnight they will be fit to be cleaned and laid by till their season of planting comes on.

TAKING UP BULBS WHICH ARE NOW PAST FLOWERING.

As the bulbous-rooted plants first planted will now have finished flowering, and their leaves beginning to decay, they should be carefully taken up, and stored in a dry airy room until the season of planting arrives. It is not necessary that all bulbous-rooted plants be thus taken annually up, but it is necessary for all the finer sorts, in order that the roots may be examined and the offsets or young roots removed, which is the mode by which these plants propagate themselves. Besides, the bulbs being taken up and kept in a dry place, have thereby a respite from action, which respite can be lengthened at the pleasure of the cultivator. Bulbs so treated are supposed to flower stronger than if they were left altogether in the ground. Whether this be the case or not, it is an important feature in their cultivation to take them up annually, and the less valuable ones in two, three, or four years, according to circumstances, that their offsets may be taken off for increasing the stock, as well as preventing an unnecessary number of plants from springing from the same centre, and thereby becoming

so weak that the flowers, though numerous, would be good for nothing.

TRAINING AND SUPPORTING PLANTS.

•Climbing-plants and shrubs should be regularly and neatly nailed or tied to the walls, pales, or supports upon which they are to be trained; and all herbaceous and annual plants should also be supported where they require it. Nothing looks so slovenly as to see plants rambling into confusion, or blown about and broken by high winds or heavy rains. The pruning-knife should be freely used in the arrangement or disposal of them, and such branches as may be broken or injured, as well as a portion of them where they grow too thick, should be removed. In supporting plants in the flower borders, much ingenuity may be displayed by selecting supports suited to the habits of the plants. The rambling growing kinds may be judiciously supported by using branches of trees with many twigs upon them; and the more crooked and rustic branches of oak, or other rugged growing trees, either with the bark left on or taken off, will form excellent conductors for *sweet peas*, *convolvuluses*, and such like rapid growing plants, and to such the plants will naturally affix themselves sooner, and more firmly, than to bare poles or finely-painted sticks, which have little of that natural appearance which should harmonize in all parts of the flower garden. Whatever conductors or supports are used, care should be taken to hide them as much as possible; and in tying them to their supports, it should be done so as to leave the plant in its natural form as much as possible. This cannot ever be well done, if the plants be once allowed to attain too great a size or age. The supports should be placed to them before they really want them, and as the plants advance in growth be neatly and securely trained to them. From the want of sufficient attention being paid to the proper management of flower-garden plants, as far as respects training and supporting, arises that want of order and neatness which we always see when this is not scrupulously attended to; and if that attention be not paid at an early period of the season, it cannot be afterwards corrected.

Climbing and creeping-plants, from their profusion of blossom and their utility in covering disagreeable objects, as well as the assistance which they afford us in producing something of picturesque or natural appearances in gardens and shrubberies, are often too much excluded from our gardens, in consequence of the great confusion into which they are too often allowed to run, from a want of training and support while young; whereas, when properly attended to, they even of themselves give a degree of well-kept appearance to the other parts of the grounds, producing pleasing associations and affording both shelter and shade.

Such plants as are planted against walls or espaliers, should be now examined, and their young shoots nailed or fastened to the wall or trellis. When the object is to obtain a thick mass of foliage, the leading or strongest shoots only should be nailed in, and the lateral and weaker branches allowed to remain in their natural position; but when a profusion of bloom is desired, and such is the case generally, particularly with rare or delicate plants, pruning to a certain extent must be attended to. Here, as in all other cases relating to pruning, a judgment must be formed of what wood is likely to produce flowers and what is not; as much of the former must be laid in as can be without confusion or crowding one another, and a supply only of the latter to fill the naked parts of the wall or espalier, and to provide a supply for the following season of such wood as will, in its turn, produce flowers also.

J U N E.

CARE OF NEWLY-PLANTED SHRUBS AND ORNAMENTAL TREES.

All newly-planted shrubs and ornamental trees should be frequently and liberally supplied with water both at their roots and also over their heads, with the garden-engine. The ground round their roots should be mulched with long littery dung, straw, or such like matter, to prevent the drought from their roots. Those which are of a large size, and are liable to be blown about by the wind, should be frequently gone over and the ground regulated round their stems, and all such as require it should be supported with stakes.

TRANSPLANTING HARDY AND HALF-HARDY ANNUALS.

All sorts of hardy annuals may now be planted out, where they are to remain in the flower garden borders, taking advantage of cloudy or showery days. All sorts of half-hardy annuals, and many tender annuals, may now also be planted out; the half-hardy ones from the beds, pots, or boxes in which they were sown, and the more tender from the pots into which they have been potted, and have hitherto been growing. As soon as planted out, they should be watered and shaded until they have struck fresh root into their borders, after which they will only require to be supported with sticks for the season. Annuals of considerable size may be safely transplanted, either where they may have come up too thick, or where it is necessary, from other causes, to remove them to fill situations in want of them, or to pot for particular purposes. In removing them, let them be taken up with as good balls as possible; and if not done in showery weather, let them be well shaded and watered. All patches of hardy annuals, which may have come up too thick, if they be not wanted for transplanting, let them be thinned out, so that each plant may have room to

grow to its full size. Most kinds of hardy annuals may still be sown to come into flower in autumn.

TENDER ANNUALS.

The tender annuals, now nearly full grown, should be removed from the frames in which they hitherto have been growing, and placed in the green-house, which will be by this time cleared of most of the plants usually kept there, and which may be kept gay all summer by being kept filled with annuals. There also they will increase in size, and be at all times ready to be removed into the drawing-room, or wherever they may be wanted; or, they may be placed in the open air, in situations perfectly sheltered both from high winds and heavy rains.

Such as are still in frames, and intended to succeed those now in flower, should be allowed plenty of air during the day, and also an abundant supply of water at their roots once every day at least.

PROPAGATING FLOWER GARDEN PLANTS BY CUTTINGS.

Such herbaceous plants as are either rare or valuable, or of such as it is desirable to have a great stock, may be now successfully propagated by cuttings of the lateral shoots of their stems, planted in fine sand, either in pots, boxes, or in a border prepared for the purpose, over which should be placed hand or bell-glasses, for the exclusion of air, until such time as they have begun to make roots, when the glasses should be removed gradually. During the time the cuttings are without roots, they should be shaded daily and watered sparingly; when of sufficient strength, they should be transplanted into nursing-beds or potted into small pots, in which they are to stand all winter.

TAKING UP BULBS.

As the bulbous-rooted plants, such as *tulips*, *hyacinths*, *polyanthuses*, *narcissuses*, *anemonics*, *ranunculuses*, &c. have

finished flowering, they should be taken up, and when dried, placed in the root-room, or in some dry airy house, each sort kept separate until the season of planting arrives. Dry days should be selected for taking them up; and when that is done, they should be laid upon mats thinly to dry, in a shaded situation, that the process of drying may go on slowly and gradually. When they are perfectly dry, they should be well cleaned, all the large roots separated from the small ones or offsets, and each sort carefully labeled. *Jonquils* should not be taken up every season like other bulbs, as they are found not to flower so well the first season after planting; their removal should only be considered necessary once in two, three, or four years, and that chiefly for separating the bulbs, which will by that time become too numerous, and if not separated would destroy one another. Some gardeners carry this system of taking up their bulbs to the extreme, and even take up *crocuses*, *snowdrops*, *irises*, *crown imperials*, and *common narcissuses* annually; while others, and by far the best cultivators, only take these up once in two or three years, in order to thin out their clustered roots, or for the purpose of propagation.

PROPAGATING CARNATIONS AND PINKS.

If the season has been favorable, the carnations and pinks in the borders will be by the end of this month fit to be propagated. It is material to begin this operation early, as the plants will thereby attain greater strength before the approach of winter, and be in a state to flower stronger next season. The modes of propagation are three; first by seeds, and this is always adopted when the object in view is new or improved varieties, and is yearly practised by the florist, who bestows considerable care in hybridizing two favourite varieties of opposite properties, so as to obtain a variety partaking less or more of its parent. The second is by pipings, or cuttings of the grass or shoots of the present year, and is most commonly practised in the propagation of pinks, as being expeditious, and generally certain; although they are sometimes also propagated, especially some of the more rare or scarce

sorts, by laying, which is the third mode of propagation, and almost always practised with carnations. The first mode, or raising by seeds, is performed in spring, and is seldom practised by any but the florist, to whom we are indebted for the many varieties of these beautiful flowers with which our gardens are adorned. Carnation-seeds do not often ripen in this country, owing principally to the shortness of our summers, but it is imported from Switzerland, and if kept from the air, will retain its vegetative properties for years; it is usually brought to us in phials well-corked, and seeds brought from abroad in this manner are found to vegetate freely; but in consequence of those who collect it, not taking the trouble to impregnate different sorts together, it is seldom that valuable kinds are produced, sometimes not one in a thousand; and even from carnation-beds cultivated in this country, a celebrated florist reckons the chance of getting a good flower being as one to one hundred: and the florist who raises six new carnations in his life-time is considered fortunate. So prone is this flower to sport, that seeds taken from the same seed-vessel has been often known to produce flowers of all the different varieties, that is *bizarres, flakes, &c.* The seeds which ripen from the end of August to the beginning of October, should be kept in the capsule or seed-vessel, in a dry room, till the beginning or middle of May, when it should be sown in pots filled with the compost in which the plants are cultivated, and merely covered with a thin sprinkling of the same compost finely sifted, sufficient to cover the seeds. At that season of the year, artificial heat is not necessary; the pots should therefore be placed in an airy part of the garden, partially shaded from the heat of the sun, and kept moderately moist, but never very wet. As soon as the plants appear about three inches high, they should be planted out on a bed of prepared compost, or good light rich garden-mould, at about ten inches or a foot asunder, and while in that situation, carefully defended from much wet and frost, by having mats or lights placed over them. These plants will most generally bloom the following summer.

The second mode of propagating the carnation is by pipings, or cuttings of the young shoots. Maddock, a celebrated culti-

vator of this flower, considered this a precarious method, and informs us that five thousand plants were piped one season, of which not above two hundred failed. Whereas, the year following, above two thousand failed out of the same number, although, in both seasons, the cultivation had been the same, without the least variation. He, however, observes, that some sorts succeed by this mode better than by laying, but that it requires great experience to distinguish such sorts from the rest. The cultivator has often to have recourse to piping, when the shoots are too short for laying, or where shoots may be broken off, or sent him from a distance, of such sorts to which he attaches a particular value.

Piping is performed by preparing the pipings or cuttings of the young shoots having two complete joints, that is, being cut off horizontally close under the second joint; the points of the leaves are to be shortened, leaving the whole length of the cutting from one inch and a half to two inches, or longer according to its strength. Some cultivators pipe their carnations by cutting them off under the third joint, but the second is most generally preferred, as the third is more hard and woody, and the pipings do not strike root so soon, nor form afterwards such handsome plants. Accordingly as the pipings are made, they should be put into a vessel of clean soft-water for a few minutes, and as soon as possible planted in the bed prepared for them, which should be as follows: A slight hot-bed should be put up for them a few days previously to the pipings being made, and covered with a few inches of fine light rich compost, which should be rendered regular and smooth, and slightly beaten down with the back of a spade. The pipings being ready, the bed should be moistened moderately, and the pipings taken out of the water, and inserted into the bed singly, in their wet state, about half an inch deep. No more of the bed should be moistened at once than is to be filled with pipings immediately after, for if not done while moist, the mould would become too compact for the pipings to enter, which they should do freely without the use of a peg, as in the way of putting in cuttings of plants generally. As soon as the pipings are placed in the mould, they should be gently watered to settle the mould fairly about their bases, and a bell-

glass placed over them as soon as the leaves become perfectly dry, which will be in a short time. On placing the glass over them, press it gently into the mould, the better to exclude the admission of air. This being done, all that is further required is to attend to shade them regularly from the sun, and clear them of all appearance of damp or decay accordingly as it may appear, and give them water when necessary; but this latter may not be required until the plants begin to root, which, as soon as it has taken place, the bell-glasses are to be gradually raised until they be entirely dispensed with. If it should be necessary to water them, at any time, before their roots are formed, it should be done early in the morning, and the glass left off for a few minutes until the leaves become dry. They should also be inured to the sun by degrees, beginning by allowing it to shine upon them in the mornings and evenings, until they can bear it with safety, after which they will soon make progress in their growth.

The third and most successful method of propagating carnations is by laying, and it is that which is most generally practised. The precise time for beginning this operation is to be determined by the forwardness or backwardness of the season or situation; the end of this month is often a good time, while some do not begin before the middle or end of the succeeding one. Hogg of Paddington, a celebrated cultivator of this flower, does not begin before the 21st of July, and continues laying till the 21st of August. Others begin before the flowers begin to expand, and are guided by the shoots or grass when it is of length and strength sufficient to admit of the operation; whilst, on the other hand, many do not begin till the flowers are fully expanded, or beginning to fade. According to previous observation, the earlier that the plants are laid, the stronger will they be before the winter sets in, and consequently will be better calculated for producing an abundant bloom the following year. The operation of laying consists in first cutting off the lower leaves of the young shoots all round the plant quite close, and then shortening the leaves at the extremity of each shoot. An incision is then made, by entering a sharp pen or budding knife about a quarter of an inch below a joint, and passing the knife up through the

centre of it, and also through the joint next to it. Thus far the operation is completed. The bed or mould round the plants should have been previously stirred up, and a small hill of fine light rich mould raised round their base. A number of small hooked pegs should be in readiness, and the layer prepared, as already described, should be bent down and buried about half an inch below the surface of the mould, in which position it should be secured by placing a hooked peg, so that it will hold the part of the layer deprived of leaves under the mould, while the top of the shoot is made to take a perpendicular direction, making the bend in the layer where the incision commenced; the mould being pressed firmly round it, it is finished: the whole of the shoots, or as many as may be intended to be laid, being, in like manner so treated, the whole are well watered, and shaded for a few days during the middle of each day. It is advisable to dress all the shoots of each plant, however great the number, or often of two or three plants, if thin of shoots, before they be pegged down, in order that they may be partially dried before they be bent down or buried in the mould. They become less brittle when partially dried, and are therefore less liable to break in the operation; besides, the sap having partly escaped will not, after being laid in the mould, be so liable to engender damp, or a disposition to decay, which sometimes is the case, when the shoots laid are succulent and full of sap. Some cultivators, as a preventive, cut off the point or nib of the tongue or talus, immediately below the joint, and consider that it assists the protusion of that granulous matter from which the fibres proceed.

Previously to the operation of laying being performed, the plants should have a good watering, particularly if dry weather, as, after the fresh mould is laid round their roots for the reception of the layers, neither the rain nor the water from the watering-pots can so readily penetrate to the roots of the plants without endangering the young layers, or displacing the mould in which they are placed.

When the young plants are properly rooted, which will be the case with some sorts in three weeks, and with others in four or five, provided that they have been attended to with

plenty of water, they should then be disengaged from the parent plants, by being cut off about an inch nearer the old plant, than where the roots of the young one are protruding. They should be carefully taken up, with as much ball at their roots as will adhere to them, and planted out in nursing-beds, to remain till wanted for planting out into the flower garden borders; but those which are considered as the most valuable sorts should be potted, one plant in each pot, of the size known as small forty-eights, and placed in a frame and shaded till they have taken fresh root and have begun to grow.

Pinks are propagated, as has been already observed, like carnations, by seed, pipings, and layers.

In the first place, to produce new varieties, *by seed*.—The pink being a much hardier plant than the carnation, it ripens its seeds more frequently with us, and is sown and afterwards treated exactly like the carnation.

By pipings.—This is the most usual method of propagating this flower, and is performed at that time when the young shoots are sufficiently strong to admit of the operation, which is generally during or immediately previous to its flowering. The operation is performed the same as has been already described for carnations, although many do not apply any bottom-heat. The application of a slight bottom-heat is the most certain and also the most expeditious method, the plants being much sooner fit for transplanting into nursing-beds.

Pinks are also sometimes propagated *by layers*, but this is only adopted when the sorts intended to be propagated are of a delicate or valuable nature; but it is never carried to any extent, as it is both tedious and troublesome.

AURICULAS AND POLYANTHUSES.

Auriculas and polyanthuses in pots should be kept in a shaded situation during the heat of the summer months, and supplied with water plentifully. Indeed, all plants of the family *Primula* should be kept in shaded and rather damp situations in summer; as, if exposed to the full sun, they will do little good, being for the most part plants of shade or natives of cold and humid atmospheres.

ALPINE PLANTS IN POTS.

Alpine plants in pots will require to be plentifully supplied with water mornings and evenings, before the sun shines upon them and after it has set; not that they require such abundant supplies of that necessary element, but the intention of repeated waterings is to cool the atmosphere around them, which at this season is too warm for many of them, particularly such as are natives of northern latitudes. They will also require to be often gone over, and all weeds picked out of the pots as they appear, and a watchful eye kept that they be not destroyed by slugs or worms. Those which are annuals should be attended to, when their seeds ripen, and immediately sown, as many of the more rare species are apt to go off after flowering; and it is therefore necessary that they be propagated either by saving their seeds, or by cuttings, or dividing at the roots.

Alpine plants planted upon rocks will require occasional watering, as their roots do not strike deep into the soil in which they grow; and being generally elevated above the general surface, are therefore more liable to be injured by droughts of long continuance.

SUPPORTING AND TRAINING PLANTS.

Support and train all plants that require it, which will give a degree of regularity, order, and neatness to the flower garden. Prune all those which require it of straggling shoots, or such as may have been injured, and thin those which are too thick of branches. Cut down all dead or decaying shoots of such plants as may be past flowering; and if the borders appear too thin in any part, let plants be brought from the reserve garden to make up the deficiency, in which there should always be a stock of plants and shrubs of great variety in pots, tubs, or boxes, ready upon all occasions to make up deficiencies, or indeed, occasionally, to give quite a new feature to the flower garden. This mode has been too little attended to in this country, but with the Chinese it is carried to a great degree of perfection; indeed, the whole contents of a Chinese flower

garden are portable ; hence, with little trouble, they can metamorphose their gardens as often as they choose, with as much ease as they can alter the arrangement of the furniture in their houses.

DRESSING THE FLOWER BORDERS.

The borders of the flower garden must be carefully attended to, and no weeds allowed to make their appearance ; they ought to be repeatedly hoed and raked, whether there be weeds in them or not, to give an air of cheerfulness and neatness to them. The oftener this operation is carried into effect, the less trouble will be given. All decaying branches or plants should be removed, and the plants regulated and tied up before the borders are finished ; the edgings, if of box, ought to be new cut, or, if of turf, should be gone over with the edging-iron, and cut neatly and fairly. The grass should be kept well mown and rolled, and no litter allowed to be seen within the boundary of the garden. The gravel walks, if any, should be regularly picked, hoed, raked, and rolled.

PRUNING ROSES.

Many of the more delicate and fine French roses are apt to die at the points of the shoots, when pruned in winter or early in spring. To remedy this evil, a second pruning of the tender shoots should be now performed, or when the flowers fade. In the same manner as in winter pruning, all dead and decaying wood should be cut out, and those shoots which have done flowering, should be shortened back to a healthy strong bud ; but those shoots, the buds of which have not yet flowered, may be left unshortened till the end of September or the beginning of October. Some prune all their best roses at this time, and their common sorts in winter, in the usual way.

J U L Y.

PLANTING EVERGREEN TREES AND SHRUBS.

Towards the end of this month, if the weather should be showery, evergreens may be successfully removed; box edgings laid and clipped, and evergreen hedges of all kinds cut. These hedges are not so generally planted now as formerly, when a formal and stiff style of gardening was in vogue, and in which they formed a prominent feature. As fences, or screens for shelter, they have their uses; and if planted in irregular lines, and not clipped, they may be admissible to a certain extent, and will answer many of the uses of dense shrubberies, without taking so many trees in their formation, or without occupying so much ground.

TAKING UP BULBOUS-ROOTED PLANTS.

As the beds of bulbous-rooted plants have done flowering, let them be taken up, as already directed, and stored by till their season of planting.

PROPAGATING CARNATIONS AND PINKS.

Continue to lay and pipe carnations and pinks, which will, by the beginning of this month, be in good order. (For full directions, *see last month.*)

CARE OF CARNATIONS AND PINKS COMING INTO FLOWER.

The more choice carnations, in pots or in prepared beds, should now be attended to. Those in pots should be removed to the green-house and placed in a shaded situation, where they will expand their blossoms without injury; and where there is a stage-frame on which to place these plants, it should now be filled with them. Previously to taking them either into the green-house or stage-frame, the pots should be cleaned

and the surface of the mould stirred up, to give them a neat appearance. Their flower-stalks should be neatly supported, and where there are too many flower-buds upon the plants, they should be thinned out. Cut off, with a sharp knife, all the smallest flower-buds, in order that the larger may have room to expand their petals, and that they may not be robbed of a due share of nourishment.

Such of the flowers as may appear to burst or open sooner on one side of the calix than the other, should be assisted by opening the opposite side with a sharp-pointed pen-knife, in two or three places, to assist the petals in their regular expansion. This process of slitting the flower-pod must not be done in a careless manner, nor too much be done at a time, but repeated frequently, and done with care and judgment. It is also of much use, in order to prevent this premature bursting of the calix, to tie it round near the middle with a fresh bit of matting or other bandage. The florists most generally for this purpose use narrow slips of bladder, which they wrap round the bud, and fasten them to it with gum-water.

To prolong the season of these flowers, it is necessary that they be protected both from excessive sun-shine and rain. When the plants stand singly in the borders, it is more difficult to provide sufficient shelter for them, than when they are in beds, or in pots, where they can be either covered with a canvas awning, or the pots removed under shelter. Florists use for those which stand singly small tin caps, in form of an umbrella, and from six to ten inches in diameter; each cap is furnished with a square tube on the summit, through which the stick that supports the plant is passed and made fast by a wedge, or often by a nail, which passes through the side of the tube and into the stick, which secures the cap at any distance from the flower which may be selected. Where carnations are cultivated on a large scale, it is better to have them in one bed or beds, where they can be protected by an awning of canvas, supported over them sufficiently high to admit the owner to walk freely underneath, which awning can be drawn up and down, as occasion may require, by means of pullies and lines. Those that cultivate florists' flowers should not be without such frames, for they serve the purpose of sheltering the early

blooming *hyacinths*, *tulips*, *ranunculuses*, and *anemonies*; and when those flowers are over, they come into use in the protection of carnations and pinks. There are few cultivators of this flower who do not prefer having their plants in pots, as being more portable and less subject to accidents, arising from various causes, of which the carnation is peculiarly impatient.

Those who are high in the fancy, approve of stages about fifteen or eighteen inches high, on which to stand the plants, in order that they may be seen to greater advantage, as being brought nearer to the eye. These stages should be made very strong, as the weight of pots that they may have to sustain will be great; and in order to prevent the intrusion of *ear-wigs*, which are very destructive to the flowers of carnations, they place the posts or supporters of this stage into pans of water. If the bottoms of the posts be painted over every four or five days with oil of the coarsest quality, no insects will ascend by them. Oil, in all shapes, is destructive to insects, and the least drop of it applied to the backs of most of them, proves instantly fatal.

Florists attach great mystery to the cultivation of their favorite flowers, and it cannot be denied that they follow many very absurd and ridiculous customs, such as the preparation of their composts; the numerous ingredients, of which many of them are composed, are at decided variance with each other, and with common sense. The perfection of a florist's flower is one of his own making, as if Nature herself were deficient in this important point, or that he himself were superior in judgment to Nature herself. Hence the variance which has always subsisted between the florist and the botanist, who admires Nature as she really is, and treats the pampered production of the other as a monstrosity.

“ ————— Who can paint
Like Nature? Can imagination boast,
Amid its gay creation, hues like her's?
Or, can it mix them with that matchless skill,
And lose them in each other, as appears
In every bud that blows?”

CRITERION OF A FINE CARNATION.

A celebrated florist gives the following as the criterion of a fine carnation: "The stem should be strong, tall, and straight, not less than thirty nor more than forty-five inches high. The foot-stalks supporting the flowers should be strong and elastic, and of a proportioned length. The flower or *corolla* should not be less than three inches in diameter, consisting of a great number of large well-formed petals, but neither so many as to give it a crowded or too full appearance, nor so few as to make it appear too thin and empty. The *petals* should be long, broad, and substantial, particularly those of the lower or outer circle, commonly called the guard-leaves; these should rise perpendicularly about half an inch above the calix, and then turn off gracefully in a horizontal direction, supporting the interior *petals*, and altogether forming a convex and nearly hemispherical *corolla*. The interior *petals* should rather decrease in size as they approach the centre of the flower, which should be completely filled with them. The *petals* should be regularly disposed alike on every side, imbricating each other in such a manner as that both their respective and united beauties may captivate the eye at the same instant. They should be nearly flat; however, a small degree of concavity or inflection at the *lamina* or broad end is allowable, but their edges should be perfectly entire; that is, free from notches, fringe, or indenture. The *calix* should be at least one inch in length, terminating with broad points, sufficiently strong to hold the narrow bases of the *petals* in a close and circular body. Of whatever colour the flower may be possessed, they should be perfectly distinct, and disposed in long regular stripes, broadest at the edge of the *lamina*, and gradually becoming narrower as they approach the *unguis*, or base of the *petal*, then terminating in a fine point. Each *petal* should have a due proportion of white; for example, one-half, or nearly so, which should be perfectly clear and free from spots."

"*Bizarres*, or those which contain two colors upon a white ground, are esteemed rather preferable to flakes, which have but one, especially when their colours are remarkably rich and

very regularly distributed. Scarlet, purple, and pink, are the three colours most predominant in the carnation. The two first are seldom to be met with in the same flower, but the two latter are very frequently found.

“Where the scarlet predominates, and is united with a paler colour, or, as it sometimes happens, with a very deep purple upon a white ground, it constitutes a scarlet bizarre, of which there are many shades and varieties; some richer and others paler in their colours, as is the case with all the rest. Pink bizarres, are so called when the pink abounds; purple bizarres when the purple abounds; crimson bizarres consist of a deep purple and rich pink.

“When the pink flake is very high in colour, it is distinguished by the appellation of a rose-flake; but there are some so nearly in the medium between a pink and scarlet, that it can scarcely be defined to what class it belongs.” To these varieties may be added picotees, which are highly esteemed by some cultivators, on account of being hardier than the generality of carnations, and are therefore desirable for the flower borders; independently of which, they are of themselves very beautiful, and are distinguished from the others, their colours being principally yellow and white spotted, while the others have their colours in stripes. Their cultivation and propagation are similar to that laid down for carnations.

The enemies which annoy the carnation, are earwigs, slugs, green-fly, above the surface of the ground, and that destructive insect, the wire-worm, beneath it. The three former are easily destroyed, by following the directions already laid down in the foregoing parts of this work; but the latter is not easily got rid of, except by carefully searching for it in the ground, which cannot ever be carried to any great extent. When it makes its appearance in pots, it may be readily detected by turning out the mould and potting the plants in fresh compost.

Pinks not being so tender in their nature as carnations, they are brought to great perfection with much less trouble, and are seldom cultivated in pots to any great extent. However, the choice kinds of pinks in beds should, during their season of blooming, be protected by a screen similar to that used for carnations, to protect them from the sun and heavy rains,

which would much injure their colours and hasten the decay of their flowers. Those which seem disposed to burst, should be assisted as already directed for carnations, and neatly tied up to sticks to support the flower.

CRITERION OF A FINE DOUBLE PINK.

Florists consider that a fine pink should not be less than twelve inches in height, having a stem strong, elastic, and erect; that the *calix* should in form and proportion be like that of the carnation, but of course smaller; that the flower in its formation should also agree with the formation of that flower, and be not less than two inches and a half in diameter. The *petals* should be large, broad, and substantial, and finely fringed or serrated round their edges, but not so much so as to appear in deep notches or indentures. The finer the fringe is, the nearer they approach to perfection; and those are considered the finest which are perfectly entire, or what florists term rose-leaved, that is, without any fringe whatever. The broadest part of the *petal*, that is, the part farthest from the eye, should be perfectly white, and distinct from it, unless it be a laced pink; that is, one which is so called from its being ornamented by a continuation of the color of the eye round it; bold, clean, and distinct, leaving a considerable portion of white in the centre, perfectly free from any tinge or spot. The eye should be equal in proportion to the white, or nearly so, and the darker it is the better. Bright or dark rich crimson or purple, resembling velvet, is esteemed, but the nearer it approaches to black, the higher it is prized.

SOWING MIGNIONETTE FOR WINTER AND SPRING USE.

Mignonette has long been a popular flower; the agreeable fragrance of its bloom has long insured it a place in our gardens and rooms. During summer it is a plant of the easiest culture, and will grow in any soil or situation; like all other aromatic plants, its fragrance is most powerful when grown in light barren soil, fully exposed to the sun. To have it in perfection during winter has long been considered a *deside-*

ratum, and the London nurserymen have tried various plans to procure it during that season. It is an article of considerable importance to them in a commercial point of view; some of them, such as Colvil, having not less than from one to five thousand pots annually fit for sale from November till April.

Those who cultivate this plant for the London market, sow the seed at different times, from the result of a long experience, and they fix the times of sowing to correspond with the time they expect a demand for it. To obtain plants in bloom during the months of January and February, they sow in the open ground about the end of July, sowing the seeds thin, that the plants may be stocky. By the middle of September these plants will be fit for potting. They choose pots of various sizes, those of the sizes called thirty-two's are the most convenient; into these pots they plant from eight to twelve plants, thinning them out afterwards, should they be too thick. The mould of which they make use is rather light and porous, admitting the water to pass freely through it. After potting the plants, they are placed into a cold pit or frame, and shaded for a few days until they have fully established themselves; after which, they are exposed to the weather, without any protection, except from dashing rains, till November. By the first of that month they are showing flowers, and should then be removed into the green-house, conservatory, or drawing-room, where they will continue to flower during the whole of the winter. A second crop is sown not later than the 25th of August, which comes into perfection in March, April, and May.

This crop is sown in the pots where it is to remain, and plunged in any dry border, or placed upon a bed of coal-ashes, as they cannot be injured by the weather while young. In November this crop is thinned, leaving eight or ten plants in each pot, and at that time are covered with a frame, and the glasses put on during night and in cold or snowy days, taking care that they sustain no injury either by frost or rain. To prevent the pots from being broken by the expansion of frost, as well as to protect the roots, they are plunged in rotten tan, if not already plunged; but when the weather is so severe as to freeze the mould in the pots, even slightly, the

sashes should be covered with mats. The crop for the spring supply should be sown not later than the 25th of February, and will come into perfection by the middle or end of May. This sowing should be placed on a gentle heat, which should be kept up by renewing the linings as the heat declines.

There is a variety called the tree-mignonette, which is much sought after, and is propagated from seeds sown in spring, and also by cuttings, which strike root without much difficulty. When sufficiently rooted, if from cuttings, or if from seeds and strong enough, they should be potted into small pots, and forwarded with a little heat. As the plants advance, they should be trained to a single stem, displacing all lateral shoots as they appear, but taking care not to injure the leaves upon the stem which draw nourishment to the plant. When this stem has attained a height which is deemed sufficient, the lateral shoots are then allowed to grow from it, near the top, and as they extend themselves, they should be frequently stopped by pinching their points off, so as to form a bushy head. By autumn, the plants will have attained the shape of a tree in miniature, and will be covered with bloom. As the plants increase in size, they should be once or twice shifted into larger pots; however, leaving them, when full grown, in pots of the size called small thirty-two's. By a similar mode of treatment, plants of the common mignonette will attain the same habit; and if kept in training, by continually pinching the shoots and keeping the plants rather dry, they may be kept for several years. We have more than once had plants of mignonette in this way four years old, and have been assured by a botanical friend that he has had a plant, similarly treated, remain in perfect health seven years.

AUGUST.

PLANTING EVERGREEN TREES AND SHRUBS.

This is a season when most evergreens may be removed with success, particularly if the weather should be moist; if not, recourse must be had to the watering-pot and garden-engine. Box edgings and evergreen hedges may also now be cut or trimmed, if not done last month. Large evergreens may also be headed down, and all that are in want of pruning may now be done with propriety.

PROPAGATING EVERGREEN SHRUBS, &c.

Evergreen shrubs are propagated by layers, cuttings, &c. To obtain handsome specimens of these, as well as of all other trees and shrubs, we have already observed that propagation by seeds is to be preferred. However, for many purposes for which evergreens are used, such as forming underwood in plantations and cover for game, plants originated by laying or from cuttings are generally used. At this season, cuttings may be successfully put in, but the sooner in the month the better, that the plants may be rooted before the approach of winter; for this purpose, cuttings of the young wood should be planted in a shaded situation, in beds of common garden-mould, and as thick in the bed as convenient to plant them. The cuttings should not be shortened, neither should any of the leaves be taken off nor shortened, unless such as would be buried in the ground. The cuttings may be from a foot in length, or longer, to three or four inches, according to circumstances; and being well fixed in the mould, and occasionally watered, will soon emit roots, and be by this time next year in fit order to plant out into nursery-lines, to attain a size fit for planting out where they may be afterwards required.

PROPAGATING HERBACEOUS PLANTS.

Herbaceous plants are propagated by seeds, cuttings of the stems and roots, and by splitting or dividing them into smaller pieces. Propagation by seeds and by cuttings of the roots, are performed generally in spring, in order that the young seedling-plants may attain a sufficient size the first year of their growth, to enable them to withstand the approaching winter; and propagation by cuttings of the roots is performed at that season also, as soon or immediately before their vegetating powers become affected by the natural influence of the season. Propagation, by cuttings of the stem, may be performed at any period after the plant has nearly attained its full size, till it becomes too hard and dry; after which time the success will be less certain. Almost all herbaceous perennial plants can be propagated by this method; and to increase any scarce species, it is certainly of all methods the most certain and expeditious. Propagation, by dividing at the roots, is often performed, and may be practised at any season of the year upon many plants; those that are of evergreen and diminutive habits in particular. Those which attain a large size are less calculated for this mode of propagation during their season of growth; but from the time that they begin to decay in autumn, till they have begun to grow again in spring, they may, with the greatest safety, be divided, and almost increased at pleasure.

CARNATIONS AND PINKS.

Carnations and pinks may still be propagated by laying and piping, but the sooner it be now done the more strong will the plants be before winter. Carnations laid last month, should be looked over, as many of them, and by far the greater part, will have struck root sufficiently to warrant their being separated from the parent plants. The finer kinds will require, for their greater safety, to be potted in small pots, one plant in each, in the size called large sixties, or small forty-eights; and as soon as they are potted they should be moderately

watered, and placed in a shaded place, till the season approaches, when they will have to be placed in frames for their winter habitation. Those which are less valuable, are generally called border flowers, and those planted in our flower gardens, should, when fully rooted, be also taken off, which they will be in from four to six weeks after laying, and planted in beds in a warm border, or other well-sheltered place, at five or six inches apart, or more, according to their size, where they are to remain till planted out in the flower borders, either in autumn, or with greater success in spring.

Pinks propagated by pipings last month, should also be looked over; and if sufficiently rooted, they should be taken up and planted in a sheltered situation in nursing-beds, five or six inches apart, in which they are to remain until they are planted out in the flower borders. Such pipings as may not yet have made sufficient roots, should be, as often as they require it, supplied with water and kept clear of weeds.

AURICULAS.

Auriculas in pots, of the finer kinds, or such as are planted in the flower borders, the offsets of which were not taken off in May, may now be done, and the finer or scarcer sorts potted in pots of the size called large sixties, or small forty-eights, where they will remain till spring, to be potted off into larger ones. The more common kinds, when taken off, may be planted in beds in the reserve garden, and attended to with water and shade for a few weeks, when they will be sufficiently established to be either planted out or left till spring.

ALPINE PLANTS IN POTS.

The collection of Alpine plants in pots should be gone over, and any of the more rare divided, if done flowering, to increase the stock. Those which have perfected their seeds, or which are in progress of perfection, such as the families of *Draba*, *Arabis*, and indeed most of the plants of

the natural order of *Cruciferae*, should be carefully watched, that their seeds may be saved, and a part of each species immediately sown; the remainder to be saved till spring, in order to ensure a more positive success. Such plants freely perfect their seeds with us, and their propagation by other means is not so convenient.

Plants of the natural order of *Saxifrageae*, and those which are allied to it in *habit*, readily propagate by dividing the whole plant; and most of them will increase by such means, whether each piece be furnished with roots or not. Weeds should be carefully eradicated, and great attention paid to render the atmosphere round them both humid and temperate at this time, when we have generally our hottest weather: this is only to be effected by water, freely and judiciously applied to them, and a regular and sufficient degree of shade; but, as we have already observed, they should not be placed under the drip nor the shade of trees.

TRANSPLANTING SEEDLING PERENNIAL AND BIENNIAL PLANTS.

Such plants as may have been originated from seed, of the above denominations, if sufficiently strong, may be safely transplanted out of the seed-bed into nursery-beds; or many of the strongest plants may be removed at once into the situations where they are ultimately to remain.

Advantage should be taken of moist days for this operation; but if such should not occur, recourse must be had to the watering-pot and shading, which must be continued until rain comes, or until the plants be sufficiently rooted.

GATHERING FLOWER-SEEDS.

Flower-seeds, whether annual, biennial, or perennial, should be now carefully gathered as they ripen, where the intention is either to propagate rare or curious species, or for the purpose of sale. As each species ripens, they should be carefully collected and deposited in bags, if the quantity be considerable; but if small, into small paper packages. In the former case,

having the name carefully written on a wooden or paper label, and put into the bag for greater certainty. Upon the outside of each bag the name should also be written, for the greater convenience of ascertaining the different sorts. Those which are in smaller packages should have their *generic* and *specific* name also written upon the outer side of each packet. As they are collected, and when sufficiently dried, they should be laid by in the seed-room, or other dry place, till the season of sowing; however, they should be occasionally examined, to see that none have been laid by in a damp state, which, if not detected, would soon destroy the vegetative powers of the seeds.

The saving of flower-seeds is seldom carried to any extent in the gardens of private individuals, neither would any return be adequate to the expense and trouble of collecting and curing, as the generality of them can always be purchased much cheaper than they can be grown and saved. We here, however, allude to such kinds, as are either curious, rare, or interesting to the owner or manager of the garden; indeed, the cultivator, who is high in the fancy of cultivating rare or curious specimens, or of promulgating many varieties of certain species, will always find ample employment at this season. The production of hybrids or mules is a favorite pursuit of many; and this is attained by bringing the fertilizing dust of one plant in contact with the feminine pollen of another. The progeny thus produced often, in some species, participate of the characters of both, and those seed-vessels which may have been thus operated on, should be distinctly marked when gathered, and their future merits ascertained.

SEPTEMBER.

TRANSPLANTING FLOWER GARDEN PLANTS.

Those plants which may have been originated from seeds, cuttings, or by other modes of propagation, may now be planted out; the strongest where they are to remain to bloom, and the weaker or superabundant ones into nursery-beds, to gain strength, and to serve as a reserve-stock for future supplies. Advantage should be taken of moist days for this purpose; indeed, it is in all cases better to defer planting a few days, than to plant when the ground is too dry and the sunshine powerful; no artificial watering is equal to the watering of nature.

PROPAGATING HERBACEOUS PLANTS.

Continue the propagation of these plants either by the process of the division of the roots, or by sowing seeds which have been saved during the season. Some of the more rapid growing sorts may be propagated by cuttings, but the sooner in the month that this operation is performed the better, in order that the plants may be sufficiently rooted before vegetation ceases. Such plants as may be out of flower, and whose flower-stems are decaying, may be divided at the root; and, if sufficiently strong, planted out, where they are permanently to remain.

PLANTING BULBOUS ROOTS.

Towards the end of this month, beds should be got ready for the reception of *hyacinths*, *tulips*, *ranunculuses*, *anemonies*, &c., where they are to be planted in masses. For this purpose, the ground should be dug or trenched two feet deep, breaking the mould fine, and laid out in breaths of convenient dimensions. When the beds are ready, the roots should be planted in lines across, and at depths according to

the kinds planted; the two former requiring to be planted deeper than the two latter. It is always better, in planting bulbs, to plant them too shallow than too deep, as it can be remedied, if they be too shallow, at any time, by surfacing the beds with a portion of prepared mould; whereas, if they be too deeply planted, they cannot be so safely uncovered of the superabundant mould, without endangering the buds of the bulbs.

Where bulbs are to be planted in patches, or singly, in the borders of the flower garden, the spots being marked out, should be loosened up to the above depth, particularly if the soil be strong and adhesive; but where of a sandy light texture, one foot will be sufficient. In the former case, a portion of vegetable mould or sharp sand should be added, to correct the stiffness or adhesiveness of the soil. When planted, neat pegs should be placed in the centre of each patch, to serve as a guide in digging or hoeing the ground afterwards, or until the plants come up, that they may not be destroyed.

CARNATIONS AND PINKS.

The layers of carnations, and pipings of pinks, that may not have been removed from the parent plants or from the hand-glasses where they have been struck, should now be taken off early this month; if not done before the end, it will be safer to let them remain where they are until the spring.

AURICULAS IN POTS.

Towards the end of the month, the finer auriculas in pots should be removed to their winter habitation, either into the stage-frame or into some dry airy and warm situation, where they can be protected during the winter with frames and glasses; for, although the auricula, *Primula auricula*, be a native of the central parts of Europe, and in altitudes considerably affected with cold, still those varieties, produced by long cultivation, are as much altered, in regard to their natural hardihood, as they are improved by the fostering care of the florist. They will withstand well a considerable degree of dry cold, but cold accompanied with wet will soon destroy them.

Until the month of November they need not be constantly covered, but only protected occasionally from heavy rains, or similar injury. As their leaves decay round the bottom of the stem, they should be carefully removed, as they tend to engender mouldiness and decay. The surface of the mould in the pots should also be frequently and carefully stirred, but not deep, for fear of injuring the roots which are nearest to the surface. A few small pebbles, sand-stone chips, or oyster-shells, placed on the surface of the pots, will greatly tend to prevent dampness, which is all that has to be guarded against in the cultivation of this charming flower at this season, and until vegetation commences in spring.

ALPINE PLANTS IN POTS.

Many of the more delicate Alpine plants should now be placed in the Alpine pits or frames, where they are to be wintered, as the season is now approaching when damp and a superabundance of rain cannot be otherwise guarded against. Damp is certain destruction to most plants which are natives of barren or rocky situations, and those in a state of cultivation are more liable to its ill effects, than those which are in their native soils. Cultivation produces an enlargement of parts, which enlargement is made up of matter extremely liable to decay, particularly when in close and humid situations.

It will now be necessary, therefore, to place the more rare, and such as are likely to be injured by much damp, in the frames; but here they should not be covered, unless in times of rain, for if they be covered they will be drawn up weakly, and their vegetative powers excited at a season when they should be at rest. Those which are less delicate, when they appear too damp, should be laid over on their sides to drip until they be dry, and then to be replaced in an upright position. Worms will now be troublesome to them, and to all plants in pots; they can be easily destroyed by watering the whole over with lime-water, or the pots in which they appear to be, inverted, and the plant taken out with the ball entire, when in most cases the worms will be detected, scarcely covered with mould. Those who are partial to these humble

and interesting plants, will not consider it a task to watch over their welfare from this time till the return of spring, when their attention will be amply repaid by the elegance, the perfection, and simplicity of their varied blossoms.

TRANSPLANTING PERENNIAL PLANTS.

Continue to transplant into the borders where they may be required, all herbaceous plants propagated during the season, as they become sufficiently strong, but those which are not now sufficiently stout should be left till spring; for, if they be now planted, they might not be sufficiently established before the winter, unless the autumn should be mild.

Those herbaceous plants which may have finished flowering, and may have overgrown the bounds prescribed for them, may be divided or reduced in size, and planted out, where they are to remain.

TRANSPLANTING FLOWERING SHRUBS.

Many hardy deciduous flowering shrubs may be planted by the end of the month, particularly such as may have by that time shed their foliage or finished their year's growth. From that time, till the end of March, this operation may be safely performed if the weather permit.

Shrubs for particular purposes, which have been planted by the end of this month, or perhaps earlier, should have repeated waterings given them, both at their roots and over-head, particularly if the season be dry and the soil light and sandy. By this early planting, under favorable circumstances, the plants will take root this autumn, and go on in spring, as if they had sustained no check.

PLANTING EVERGREENS.

Evergreens may be now planted, observing, if the weather be not showery, to give copious waterings at their roots, and also over their tops, by applying water from the garden-engine two or three times a-week, preferring the afternoon or evening for that purpose.

GATHERING FLOWER-SEEDS.

Continue to watch the ripening of all sorts of flower-seeds which it may be desirable to propagate in quantities, as well as those which are only annual or biennial. From a want of due attention being paid to this simple practice, our lists of cultivated biennials are small when compared to the number that exist, and that have been introduced into the country. Many interesting and beautiful plants belong to this denomination, that would be an ornament to our gardens.

A reference to the *British Flower Garden*, published by that indefatigable botanist, Mr. R. Sweet, will exhibit a striking proof of the truth of the above assertion, as great attention has been paid to figure most of the biennial plants recently introduced, and may be considered the chief stimulus for their rapid introduction into all the best gardens of the kingdom. Many of these, however, do not freely perfect their seeds with us in the open air, a little assistance is therefore necessary, on the part of the cultivator, to perpetuate his favorite species; and this can, in most cases, be completely effected by protecting some with hand-glasses after the flowers begin to fade, and the culture of a few others of the most tender in pots, where they may be taken into a pit or frame for a similar purpose.

OCTOBER.

PLANTING DECIDUOUS SHRUBS AND ORNAMENTAL TREES.

Trees and shrubs of all sorts may be successfully planted from this time till the end of March, avoiding frosty weather; and ground intended to be planted should now be got ready by trenching, &c.

PLANTING EVERGREEN TREES AND SHRUBS.

The planting of evergreen trees and shrubs may be proceeded with successfully, attending to the directions already given, in watering and supporting them, particularly those which are of considerable size, in order that the winds of autumn and winter may not blow them about, which will completely prevent them from making fresh roots, or destroy those which are in the process of being made. Each tree should, immediately after planting, be neatly and firmly supported, by placing one or more stakes in the ground, and inclining them inwards to its stem or to its principal branches. To prevent the friction from destroying the bark, pieces of old matting or pads of hay-bands should be used to place between the tree and the supports; these should be firmly tied with new tarred cord, in order to keep the whole steady; but, notwithstanding this support, they should occasionally be gone over and examined, that they may not be loosened at their root, as well as that the supports do not press too much upon the stem of the trees, by which the bark would be injured. As each tree is planted, it should have a potful of water given it at its roots, or more or less, according to the size of the tree and moisture of the ground.

PLANTING HERBACEOUS PLANTS.

Herbaceous plants may now be planted either from the reserve garden, or such plants as have overgrown their allotted

spaces may be reduced in size, and the pieces taken off and planted out where they are to remain.

PLANTING BULBOUS ROOTS.

Any time this month, bulbous roots of all kinds may be planted with success. Those who cultivate these flowers to a considerable extent, either for amusement or profit, have different seasons for planting, so as to prolong the season of flowering to a greater length of time. But, for general purposes, October, November, February, and March, are generally chosen.

Bulbous-rooted plants differ in their mode of cultivation from most other plants, inasmuch as the majority of plants, when once planted, remain to occupy the same space for some length of time, some for years and others during their lives; whereas bulbs, for the most part, require to be taken up once every other year, and all the most valuable ones, annually. The reason assigned for this difference of cultivation is, that most bulbs multiply exceedingly fast, that is, great numbers of young bulbs originate under ground, from the sides of the parent bulb, and in a short time would send up a superfluous number of stems, much more than could be properly nourished on the area on which they grow; and these would, as a consequence, choke each other, and finally decay. Other species of bulbous-rooted plants form their young bulbs under the parent one, and thus, in the course of a few years, recede so far from the surface, that they are unable to penetrate through the depth of mould over them, and, as a consequence, cease to appear; while others, which form their new bulbs over the parent ones, at last come above the surface, and are killed by frosts, droughts, and other causes.

Florists, who are the best managers of these matters, take up their most valuable varieties annually; and the superintendants of flower gardens content themselves with taking up the least valuable, or what are termed border-flowers, once in two, three, or even four years, unless the place occupied with bulbs be intended to be occupied with something else during their season of inactivity.

All bulbs may be with propriety taken up when their leaves wither and decay, but not sooner; for, if a bulb be disturbed while its leaves are making, or before it shows evident signs of being ripe, it is very much injured, and often entirely killed. The leaves of all plants serve most essential purposes, and the health of the majority of plants is affected, more or less, when these are either destroyed, taken off, or injured, and the bulbs, in a particular degree; for, if these be taken off, or even much injured, or the bulb transplanted without sufficient care, so that no check be given to its growth, the bulb will be so much injured that it will not be in a fit state to flower the succeeding year, or probably for the second or third following.

The exact time that bulbs should remain out of the ground is difficult to determine; we not unfrequently see bulbs prosper well which are taken up one day and planted the next, while others of the same species may be kept out of the ground for months, and little difference is seen in the strength or beauty of their flowers.

The object which cultivators have in view, generally, in removing bulbs for a time from the ground, is, first, to separate the young or small ones, for the purpose of propagation, and to facilitate their being planted at more regular distances; and, secondly, to set the bulbs more completely at rest, and thereby render them considerably more excitable when again planted.

Some bulbous-rooted plants propagate so rapidly, as, for instance, some species of *Ornithogalum*, *Scilla*, *Muscari*, *Oxalis*, *Allium*, and *Iris*, by throwing out so many young bulbs, that they really cease to send up flower-stalks. To remedy this evil, they should be annually taken up, their young bulbs removed, and the parent, or some of the strongest ones, planted singly, where it is desirable that they should flower; or, by sacrificing the offspring, by destroying the young leaves as they appear, the old bulb will send up its flower-stalk annually. Where the object is rather to increase the bulb for flowering than the propagation of the species, the young bulbs should be destroyed as soon as they are known to exist, which will be determined by their sending up young leaves; these young bulbs should be destroyed or displaced by clearing

away the mould carefully from round the parent bulb with the hand, and with a blunt stick, or other such instrument, removed, so as not to injure the parent bulb.

By thus sacrificing the young plants, most of that nourishment which would have gone for their support, at least while young, will be diverted into the parent bulb, and will be the cause of its flowering much stronger the same season, and of collecting additional strength for that of the succeeding one. Florists, where the saving of seeds is not an object, always pinch off the flower soon after it begins to decay, so that it may not tend to rob the bulb of an unnecessary degree of food.

The method of propagation by dividing the roots, is, by separating the young offsets from the parent; bulbs are also propagated by seeds, but this is chiefly done with a view to obtain new or valuable varieties, and is chiefly the province of the amateur florist. Cultivators, in general, being content to purchase new varieties of them, employ no other mode of propagation but that of separating the bulbs.

Bulbs in general succeed best in a light rich sandy soil; but those who are high in the fancy of bulb growing, employ strange mixtures for their best beds of flowers. Each sort of bulb they consider requires a soil peculiar to them. We will not enter into the detail of those soils and mixtures recommended by those who make the flowering of a *tulip* or a *hyacinth* a subject of mystery, being perfectly convinced that all their boasted properties, when once exposed, will be found of little value. The rational cultivator will be content to employ much fewer and more reasonable ingredients in the preparation of his beds.

HYACINTHS.

For the cultivation of this flower, the Dutch have long been notorious, and probably in the first instance as a matter of amusement, have for many years made the propagation of the hyacinth a considerable article of commerce. It appears, that double hyacinths were not known until the beginning of the last century; for, before that time, single ones only were grown. The first double flower of this kind is said to have

been originated by Peter Voerhelm, but it is now lost. The same individual soon after raised the variety called the king of Great Britain, which was long sold for the sum of one hundred pounds sterling, a great price in those days, and is supposed to be the oldest variety of double hyacinth in existence. Instances have occurred of the price of one bulb being as much as two hundred pounds; such prices, however, are not now given, the taste for bulbs having in a great measure given place to plants of a different description.

In the cultivation of this flower, the Dutch still excel us, and supply us annually with dried bulbs, which are sold by the nurserymen, the more common kinds at from forty to sixty shillings per hundred, the better sorts at from one to ten shillings per root, and there are only a very few of the most rare that are rated at more than ten pounds per root.

Some of the Haerlem florists, who are the most noted in Holland, use a soil for their best bulbs comprised of the following ingredients.

Two sixth-parts of grey sand, not sharp, but handling smooth and a little greasy, two sixth-parts of well-rotted cowdung, one-sixth of tanners' bark that has been used in the forcing-houses, or otherwise rotted to mould; one-sixth vegetable mould of well-rotted tree-leaves. These materials are mixed and blended in a fully-exposed place, often turned over, so that all parts of it may be well and equally exposed to the rays of the sun, and when used, it is well broken with the spade, but never sifted, which, they justly observe, would render it less porous, both for the free filtration of water as well as for the more ready penetration of the fibres.

They calculate that soil thus prepared will last about six or seven years; they do not, however, plant hyacinths in the same bed two successive years, but use such beds for other bulbs in the alternate years, nor do they plant hyacinths in this compost the first year after its preparation, for fear of their being injured by the fresh manure.

Soils have been formed of materials as nearly corresponding to those above as could be attained, but the success of our cultivation in this country has never equalled that of the Haerlem cultivators. With us many varieties degenerate in

two or three years, but the Dutch gardeners have preserved them for nearly a century.

In making up their beds, the Haerlem florists choose a sheltered situation, exposed only to the south; and, in the formation of them, they excavate the natural soil to the depth of two feet, the whole length and breadth of the bed or beds; this being removed, they then dig and finely break the mould in the bottom of the bed to the depth of nine or twelve inches more. This space they fill with the above compost, and sometimes with the following:—One-third coarse sea or river sand, one-third fresh sound earth, one-fourth rotten cowdung, completely reduced to mould, and vegetable mould, of decayed tree-leaves, for the remainder. They mix and incorporate these ingredients, and about a fortnight before the bulbs are to be planted, they fill up the bed with the compost to about four inches above the level of the natural ground, on the south-side, and about ten inches above it on the north side, so that the bed, when finished, will present an inclination to the sun, and admit of all superfluous water passing off.

Their season of general planting is from the middle of this month to the middle of the next, and is performed in the following manner:—Before planting the roots, the surface of the bed is covered with a thin layer of sandy earth raked smoothly over it, on which they mark out, with great regularity, the exact situation of each bulb. Round, and under each root, they place a little clean sand, which prevents the mould adhering too closely to them. The whole being planted, they cover the whole surface of the bed to the depth of three or four inches with fine sandy mould, leaving the bed, when finished, about eight inches above the ground-level in front, and fourteen inches behind. In the disposal of the bulbs in the bed they are at much pains, mingling the colors so that they may produce an agreeable and striking contrast.

HYACINTHS FOR FORCING.

This is a good time to pot these bulbs for being forced during the winter and early in the spring; for this purpose, narrow deep pots should be procured, which should be filled

with light rich sandy mould, into which the bulbs should be planted about half, or rather more, of the bulb being under the mould. When the bulbs are large and sound, one may be enough for one pot, but if they be small, and apparently weak, two or three may be placed in each pot. When planted, the whole should be placed on a dry level surface, and covered, to the depth of six or ten inches, with decayed tanners' bark, rotten leaves, or fine sand. They will, in such situations, soon emit fibres, and the pressure of matter above them will prevent them from being forced out of the pots, which would in many cases occur if they were not thus covered. From this situation they are to be taken as wanted, and placed in a slight bottom-heat in frames or pits; taking the first set into heat, say in November, and they will be fine in bloom at Christmas.

PLANTING HYACINTHS IN THE FLOWER BORDERS.

The more common varieties of hyacinths, which are to be planted in the borders of the flower garden, will succeed well if planted at this season, where they are to remain to flower. The only preparation that is necessary for them is to loosen the spot where each patch of two or three bulbs is to be planted, to the depth of a foot. If the soil be strong and damp, a little sea or river sand may be added to it, to render it more light; but, in any ordinary good flower garden soil, the more hardy varieties will succeed perfectly well.

PLANTING TULIPS.

According to our previous observations respecting hyacinths, the Dutch have also been long celebrated for their skill in the cultivation of the tulip. This flower, although it reached this country probably nearly as soon as it reached Holland, still our earlier gardeners did not attend to its cultivation with that enthusiasm which characterized their neighbours on the continent. It is supposed to have reached Europe in 1559, and we are informed that it was cultivated in England so soon after as 1577. It became an article of considerable trade in the Netherlands about the middle of the seventeenth century; and to

such an extreme was a love for this plant carried, that between four and five hundred pounds have been given for a single root. A Scotchman, it is reported, was once so enraptured with it, that he resided for a long time at Rome, in an uncomfortable dwelling, to enjoy his passion for this flower; and to such an extreme did he carry his care of them, that he is said to have placed two fierce dogs as guards over his tulip beds.

Tulips, like all other bulbous-rooted plants, like a deep, rich, light sandy soil, but they will grow very well in most ordinary garden soil that is not too damp nor heavy. The tulip growers make choice of an open airy situation for their principal beds; and Hogg of Paddington, an enthusiastic cultivator of this flower, recommends a soil of a fresh rich sandy loam, which has been at least twelve months dug and exposed to the air previously to using, moderately enriched with well-rotted dung. In forming the beds, florists excavate the natural soil, the whole length and breadth of the intended bed, to the depth of twenty inches or two feet, which they fill up with the prepared mould, leaving the bed when finished somewhat convex. Upon the bed, finished in that manner, they mark, at regular distances, about seven inches apart, the situations for the bulbs, which are planted from two to three inches deep.

RANUNCULUSES AND ANEMONIES.

In dry light soils, ranunculuses and anemonies may be now planted, but in soils and situations which are wet and cold, it is better to defer planting till the end of January or the beginning of February. Where these flowers are cultivated in beds, soils may be formed suitable for them, and in such case, this month or the following is the best time for their planting, as the roots will have more time to vegetate and form themselves, and will generally flower stronger than those which are planted later in autumn or early in spring. Florists prefer a soil much stronger for their beds of *ranunculuses* and *anemonies* than for any of their other flowers. A correspondent in the Hort. Trans. uses a stiff clayey loam, with a fourth-part rotten dung. The bed, he recommends, should be prepared to the depth of eighteen inches or two feet, and not much

elevated above the ground-level, that it may the better resist the drought. In forming the bed, a stratum of well-rotted cow-dung should be placed about five inches under the surface, and well mixed with the mould below that depth; but the earth above this stratum, into which the roots are to be planted, should be kept perfectly free of dung, which would be injurious rather than otherwise to the roots of the plants. The fibres of the plants, which are the organs that collect nourishment, will derive sufficient support from the dung at this depth, but if placed deeper would be out of their reach, and would not receive so much advantage from the air, which is held to be of much consequence.

The roots should be planted in lines, either across the bed or longitudinally, and be not planted deeper than about two inches, and about five inches distant from each other, or less if the roots be small. The better way is to draw drills of that depth, into which the roots should be placed, sprinkling a little clean coarse sand into the drill previously to placing the roots in it.

JONQUILS.

These flowers will succeed well in a soil similar to that above recommended for ranunculuses and anemonies. They should be planted five or six inches apart, and about three inches deep. As jonquils do not flower so well the first season after planting, they are therefore generally left in the ground for three, four, and even five years, without being taken up.

BULBOUS IRISES.

The earlier in the month that bulbous Irises be planted, the stronger will they flower the following summer; those which are not planted till spring or late in autumn, seldom flower well, if at all, the season following. They should be planted (if in beds) at eight inches or a foot apart in light rich earth. Bulbous Irises are not taken annually up, once in three or four years being considered the better practice.

NARCISSUSES.

A light sandy soil is well adapted for the cultivation of these flowers, moderately enriched with very old cow-dung. As they do not flower well the season after planting, they are therefore seldom taken up oftener than once in four or five years, and that only to separate the bulbs which they may have made. The earlier in the month that they are planted the better.

LILIUMS.

All the species of this beautiful family deserve a place in the flower garden; the more common sorts, such as the *L. candidum*, *L. bulbiferum*, *L. martagon*, &c., will grow in almost all situations and soils in the flower borders, or in the shrubberies even under the shade of trees. The more valuable species, such as *L. canadense*, *L. japonicum*, and *L. philadelphicum*, require more attention, and will repay any care that may be taken of them by the beauty of their flowers. These are rather tender to stand out with safety in our flower borders during the winter; they should, therefore, be planted in the most favorable situations, and protected during winter with a hand-glass, as well as the surface of the ground round their roots covered with coal-ashes, to resist the effects of damp and also to exclude the frost; or they may be planted in deep pots, known by the name of bulb-pots, and removed during winter into the green-house or into pits. But bulbous plants of their size seldom flower so well in pots as when planted out, for want of sufficient scope for their fibres, which extend themselves much beyond the limits of ordinary-sized pots. Some cultivators, however, succeed in flowering them in pots; such as Griffin, of South Lambeth, whose success in flowering the *Lilium japonicum* in pots has been complete. The pots he uses are of the size called twenty-fours, and the mould in which he plants the roots is composed of about two-thirds peat and one-third loam, the bottom of the pots being well drained; the bulbs are placed not more than an inch

below the surface of the mould in the pots; during winter he protects them in a green-house or garden-frame, but he prefers the former. Much might be done in the cultivation of many plants hitherto kept in the green-house, particularly such as are herbaceous, and bulbous ones in particular, in the open borders of our flower gardens, where the situation is favorable and the superintendant possessed of zeal and activity. Borders might be prepared for their reception in sheltered and warm situations, and during winter protected with a portable frame constructed for the purpose; but even common garden-frames and lights placed over such borders, and occasionally protected from severe frosts, will be found sufficient. Such borders should present a considerable slope to the south, and be completely drained at the bottom.

ALPINE PLANTS IN POTS.

By the beginning of this month, all the collection of Alpine or other rare and curious plants in pots, should be placed in their winter quarters. The most general way of protecting these plants, is by placing them under common garden-frames and lights in a dry airy situation, where they remain till the return of spring, being carefully protected from excess of moisture as well as intense frosts.

As these beautiful and diminutive plants are an ornament to the flower garden during summer, while arranged in their summer station, and as so many of them are evergreen, they may also become an ornament to it during the winter also, when placed in a proper point of view. In our practice we have had a pit constructed in the flower garden, which served a double purpose, being the abode of a collection of these plants during winter, and when these were put out in spring it was filled with the more showy species of *Mesembryanthemums* planted out in it, which flowered beautifully till killed by the first autumnal frosts, at which time it was again filled with the Alpine plants, plunged into finely-sifted coal-ashes. The walls of this pit were constructed of rock-work, which was planted with rock-plants, and was soon completely

covered. Nothing appeared during summer of a pit, when the whole was covered with plants. The wooden wall-plates and rafters were removed as soon as the *Mesembryanthemums* had established themselves, and were only replaced in autumn, when the others were placed into it; the lights, &c. were used during summer for other purposes. In this pit, which was elevated about a foot in front and two feet behind, we cultivated for three years one of the richest private collections of these interesting plants probably ever brought together in this country.

At first sight there will appear something incongruous in placing a pit in any part of a well-arranged flower garden, but as rock-work and similar things are admitted sometimes, though rarely, in imitation of rocky strata or mountains in miniature, but for the most part with a view to form a proper situation for plants which are natives of rocky soils to grow in, we can see no difficulty nor objection in constructing and arranging a rock-work so as to be capable of being rendered a fit receptacle for such plants during the winter. But as many, and by far the greater part of the rarer species of these plants, can only prosper in a low temperature, their removal to a shaded cool spot during the heats of our summer becomes necessary, and will of course leave a space unoccupied. Few plants, therefore, can be brought in as substitutes that will have a better effect than the genus in question. Their rapid growth, and capability of withstanding our hottest suns without requiring much water, fits them in a particular degree for such a purpose.

NOVEMBER.

PLANTING DECIDUOUS SHRUBS AND ORNAMENTAL TREES.

All kinds of deciduous shrubs and ornamental trees may be now planted, if the weather and soil be not too wet, in such cases it is better to defer this operation till February or March. In light dry soils, planting should even be gone on with in times of moderate rains, or until the ground be so wet as to adhere to the spade, which may almost be considered a safe criterion to go by.

PLANTING EVERGREENS.

Evergreen trees and shrubs may be planted in sheltered situations; great care being taken that the plants be removed with good balls, and that they be not kept out of the ground for any length of time. In times of gentle showers, evergreens may be planted, but it is not advisable to remove them in times of frosts, nor cold-cutting winds.

PREPARING SHRUBS FOR FORCING.

Where it is intended to force flowering-shrubs for the drawing-room, they should now be carefully taken up, injuring the roots as little as possible, and carefully potted into suitable sized pots, observing that it is always desirable that the pots should be as small as possible, in order that they may be the more readily disposed of when taken into the house. As the plants are only intended to perfect their flowers in the pots, their dimensions may be much less than if it were intended for them to grow in them for any length of time. The chief nourishment of plants forced for this and similar purposes should be water, therefore smaller pots may be used, than is usually the case; and during the time the plants remain in the pots, attention should be paid to give this element in abundance.

The shrubs most successfully forced are Persian and common lilacs, mezerion, syringa, honeysuckles, dwarf-almond, *Erica herbacia*, *Azalia pontica*, and other varieties; *Rhododendrons* of sorts, roses, &c.

Plants of common and Persian lilacs may be successfully taken up of any size, and planted in tubs or large boxes; the former, if it be desirable, may be removed into such boxes of any size or age. In selecting plants for this purpose, choice should be made of such as are of handsome shapes, and which have the appearance of plenty of flowering-buds. When potted, they should be placed in a dry situation; those which are in smaller pots plunged up to the tops of the pots in dry light mould, saw-dust, or coal-ashes. The larger plants, in tubs or boxes, need not be plunged, but covered round with littery matter to exclude both frost and drought. In such situations they should all remain, until they be removed into the green-house or forcing-pits.

GRASS LAWNS.

Worms will now be throwing up their lumps on the lawns, which gives them a disagreeable appearance; recourse, therefore, should be had to lime-water, with which they should be well and regularly watered, which will bring up the worms to the surface, and at the same time destroy them. The lawns should be frequently swept and rolled, that is, at least once a-week during the autumn and winter months, which will render the surface more smooth and pleasant to walk upon. Mowing should be continued as long as the grass continues to grow, and in all cases left closely mown, when that operation is discontinued for the season.

GRAVEL WALKS.

Weeds will be still making their appearance, and should be destroyed by continued hoeing and raking; or, if the walks be hard and well bound together, they should be hand-picked. For the destruction of the various species of *Conferva*, *Hypnum*, and other cryptogamic plants, nothing is so effectual as

hoeing and raking in dry days. But, when walks become very much overgrown with these plants, it is better to dig them up, and thereby present a new surface, which should be rolled down soon after the operation of turning the gravel is performed.

PLANTING BULBOUS-ROOTED PLANTS.

Such of these as were not planted last month should now be done, and those which were planted, upon the appearance of frost should be covered over with straw, or with canvas, or mats, suspended on hoops, over the beds: or, the beds may now be entirely covered, three or four inches thick, with sawdust, which may remain on them till all danger of severe frosts is over, or until the plants are beginning to be too much drawn by it, when it may be cleared off a little round each plant, so as to admit air sufficient to prevent the plant from being drawn up weak.

PLANTING HERBACEOUS PLANTS.

Most of the hardy and more common herbaceous plants may now be planted, either from the reserve-garden or from such plants as may have overgrown their prescribed limits, and are in want of being reduced in size. Plants, planted at this season, will flower much stronger than those which are not planted till spring.

POTTING HERBACEOUS PLANTS FOR FORCING.

Such herbaceous plants as are intended to be forced for the drawing-room, should now be potted. As was observed in potting shrubs for a similar purpose, pots as small as possible should be used, and dependance placed upon a sufficient supply of water for their nourishment.

ALPINE PLANTS IN POTS.

If any of the Alpine plants in pots have not been placed in their winter-quarters, that should now be done, to prevent the

pots from being broken by the expansion of frost, as well as the plants being injured by too much moisture. Those which were placed under cover last month should now be frequently looked over, and all dead or decaying leaves or stems removed, as well as all mouldiness upon the surface of the mould in the pots: any thing tending to encourage decay should be carefully removed. Many of the more rare species should have the surface of the mould in the pots covered with fine sharp sand, or small fragments of porous stone or brick-bats, to act as absorbers of superabundant moisture. The glasses or covers should now be kept on during damp and wet days, and almost always during night, in order more effectually to guard against damp or too much moisture, of which most Alpine plants, in a state of cultivation, are impatient in autumn and winter.

DRESSING THE BORDERS IN THE FLOWER GARDEN.

The flower garden borders should now be dug over, and the surface, where there are not plants the roots of which might be injured by frost, left as rough as possible, so that the frost and weather may have the more power to act upon it, in order to render it more friable and in better condition for planting the following year.

TAKING UP DAHLIAS.

By the beginning of the month the frost will most probably have cut up the dahlias, which they cannot resist for any length of time; indeed they are amongst the first plants which bear evidence of the frosts of the preceding night. Being natives of Mexico, it is necessary that we protect their roots from the attacks of frost. When the stems are destroyed, they should be cut down and removed; the roots should be left in the ground, when it is not intended that they should be taken up for the purpose of dividing or transplanting, as experience proves that roots left in the ground produce their flowers earlier the succeeding season (which with this plant is a desideratum) than if they were taken up and preserved in a house

all winter. To prevent the frosts from injuring the roots left in the ground, they should be covered all winter with coal-ashes, saw-dust, or littery dung, sufficiently thick to prevent the frost from incrustating the ground beneath. Many cultivators take the roots up, and pack them amongst dry mould; while others take them up and place them upon shelves, or otherwise dispose of them till the season for planting. Others bury them in pits, like potatoes, or pack them in ridges in cellars amongst sand, or cover them with straw. It is important that they be disposed of, in whatever way they may be kept, so that they may be preserved sufficiently moist to maintain the living principle, but not so moist as to hazard their being rotted, nor yet injured by frost.

During winter, but particularly during the first few weeks after they are taken up, they should be often carefully examined, as they are more likely to become rotten when first taken into the house, than afterwards. It is of little consequence how or where they are kept during winter, so that they be dry and secured from frost. In advising that they be kept in the ground during winter, we are aware that we deviate in opinion from that of cultivators in general; however, we do not offer this opinion as being our own exclusive practice, as many cultivators adopt the same, and have come to the same conclusion, namely, that they produce their flowers much sooner and stronger. In order to prevent their becoming too bulky in the plant, a circumstance which follows this practice, we prune off all the shoots as they come up, except one, two, or three at most, according to circumstances, and continue this pruning during their whole growth, so as to model them into what size or form we choose.

D E C E M B E R.

PLANTING DECIDUOUS SHRUBS AND ORNAMENTAL TREES.

The planting of these may be gone on with while the weather is favourable, that is, when it is neither frosty nor too wet, in either case, the planting of them had better be deferred till February or March.

PROTECTING TENDER PLANTS.

Many tender ornamental shrubs and plants, which stand our summers, and ornament our gardens, require protection from our winters. Of these may be enumerated many plants hitherto treated as green-house plants, which the zeal of the cultivator may wish to acclimate, or to render sufficiently hardy to stand our variable climate by inuring them, by progressive degrees, to stand in the open air. The most likely situations for such experiments are those which are sheltered by nature, and where the soil is either naturally or artificially dry. Plants originated from seeds ripened in our green-houses, are to be preferred in the first instance, and great care taken to protect, by artificial means, those plants in the open air, until they have perfected seeds. Plants originated from such seeds are supposed to be more likely to stand unprotected, and so in proportion is the progeny of each succeeding generation. Those plants which annually die down to the ground are the most likely to be acclimated by this or any other means, and a slight protection of their roots may be considered sufficient. But those plants, which rank as shrubs or trees, are not so easily protected during winter, and should be planted on warm sheltered walls, or in sheltered places in the shrubbery, where, in either case, they can be partially protected by sticking a few fern-fronds or branches of trees round them, or entirely covered with mats or portable cases during severe frosts. The roots of all tender plants should be particularly

protected, either by covering the ground round them with littery dung, saw-dust, or coal-ashes. Where valuable or exotic plants may have been planted and trained against walls, which may be considered as an intermediate station between the green-house and shrubbery, they should be protected at their roots; and the more effectually to secure them, a portable glass-case might be made use of, which would sufficiently protect them till the return of spring. Such a compartment for the cultivation of many interesting shrubs and trees, too tender to stand unprotected with us, is much wanted; and indeed portable conservatories of different sizes would have their uses. All plants in pots should now be removed into cold frames or pits before the first attacks of frost, as, if left unprotected, many of them would be destroyed, although hardy enough of themselves to resist extreme cold when planted in the natural ground. While in such situations, they should have plenty of air admitted daily, and only protected during nights and on very severe days with glasses or reed-mats, which will effectually protect them from cold, as well as heavy rains and snow.

ALPINE PLANTS IN POTS.

Continue to look over the collection of these plants, in order that all appearance of decay may be removed, and that they may not suffer either from an excess of moisture or become too dry, which would, in either case, be extremely injurious to them.

AURICULAS, CARNATIONS, &c. IN POTS.

The more valuable auriculas, carnations, &c., in pots, should be often looked over, and all dead or decaying leaves removed, and care taken that they suffer not from a superabundance of moisture. Traps should be set, or other means used, to protect or rid them from the attacks of mice and other enemies, which swarm round protected frames at this season.

BULBOUS-ROOTED PLANTS.

Such of these as were not covered last month, should be now done early in this month, for severe frosts will be found

injurious to them. They will also require to be protected against the attacks of mice, which will burrow to their roots and destroy them.

DRESSING THE FLOWER BORDERS AND SHRUBBERY.

All vacant spaces should now be rough dug in the flower garden beds or borders where there are no plants, and all those borders which are planted that have not been dug should be neatly and carefully pointed over, taking care not to injure any of the plants in the process. If the hint be attended to which we have already given, of driving a wooden label or peg at the side of each plant, so that it be level with the surface, it will be a guide in pointing over the borders, as well as a mark to proceed by in planting.

The digging over of flower garden borders at this time, not only gives this department an appearance of order and neatness during winter, when there is little else to attract the eye, but it actually saves much time and trouble in the spring, when the gardener is usually busy; independently of which, it is attended with advantages, such as turning up the eggs or larvæ of insects, and even many of them, while in their torpid state, can be picked up by the birds. It ameliorates strong stiff soils, and renders them capable of being easier put into neat order in the spring. It admits the rain and snow to penetrate to the bottom of the borders, and to deposit certain salts beneficial to the growth of plants, and in fine, it gives a character of keeping to the whole that the hard beaten surface never can present.

A
SYSTEMATIC CATALOGUE

OF
HARDY DECIDUOUS TREES,
ORNAMENTAL AND USEFUL.

[The Figures denote the height in feet which each attains under favorable circumstances.]

ACACIA.

Julibrissin, 20 to 30.

ACER.

Montana, 20—30.

Negundo, 20—30

Lobatum, 25—35

Rubrum, 20—25.

Platanoides, 40—60.

Var. *Laciniata*, 30—40.

Pseudo-platanus, 50—60.

Var. *Argentius*, 30—40.

Var. *Auria*, 30—40.

Saccharinum, 40—50.

Opulus, 50—60.

Dasy carpum, 20—30.

Pensylvanicum, 25—35.

Hybridum, 20—30.

Campestre, 20—30.

Tartaricum, 25—35.

ÆSCULUS.

Hippocastanum, 30—40.

Pavia, 20—25.

Rosea, 20—30.

Flava, 20—30.

Discolor, 15, 20.

Ohioensis, 20—25.

AILANTHIUS.

Glandulosa, 20—30.

ALNUS.

Glutinosa, 20—30.

Var. *Laciniata*, 20—30.

Var. *Quercifolia*, 20—30.

Oblongata, 20—30.

AMYGDALUS.

Communis, 20 to 30.

BETULA.

Nigra, 50—80.

Populifolia, 30—40.

Excelsa, 50—60.

Daurica, 30—40.

Alba, 40—60.

Lenta, 50—70.

Lutea, 40—50.

CASTANEA.

Vesca, 40—60.

Var. *Auria*, 20—30.

Var. *Argentia*, 20—30.

Var. *Hetrophylla*, 20—30

Americana, 40—60.

CARPINUS.

Betulus, 30—35.

Americanus, 35—40.

Orientalis, 20—30.

CEPHALANTHUS.

Occidentalis, 20—30.

COMPTONIA.

Asplenifolia, 20—30.

CELTIS.

Australis, 40—50.

Occidentalis, 20—30.

CERCIS.

Siliquastrum, 20—30.

CATALPA.

Syringifolia, 20—30.

CUPRESSUS.

Distica, 30—40.

- CYTISSUS.**
Laburnum, 30 to 40.
- DIOSPYROS.**
Virginiana, 20—30.
Lotus, 20—30.
- FAGUS.**
Sylvatica, 50—80.
Var. Purpuria, 30—40.
Ferruginea, 40—50
- FRAXINUS.**
Excelsior, 50—80.
Var. Pendula.
Americana, 20—30.
Var. Pubescens, 20—30.
Hetrophylla, 30—40.
Quadrangulata, 50—60.
Fusca, 15—25
- GLEDITSCHIA.**
Triacanthos, 30—40.
- GYMNOCLADUS.**
Canadensis, 20—30.
- JUNGLANS.**
Regia, 50—60
Alba, 30—40.
Olivæformis, 30—40.
Cinerea, 30—40.
Angustifolia, 30—40.
Nigra, 30—40.
- KOELREUTERIA.**
Paniculata, 25—35.
- LIRIODENDRON.**
Tulipifera, 50—60.
Integrifolia, 50—60.
- MAGNOLIA.**
Acuminata, 20—30.
Cordata, 20—30.
Tripetala, 30—40.
- MESPILUS.**
Oxyacantha, *et var.* 20—30.
Coccinea, 20—30.
Accrifolia, 20—30.
Cordata, 20—30.
Tanacetifolia, 20—30
Azarolus, 20—30.
Apiifolia, 20—30.
Flava, 20—30.
Crus-galli, 20—30.
Eliptica, 20—30.
Fissa, 20—30.
- Laciniata, 20 to 30.
Nigra, 20—30.
Odoratissima, 20—30.
Germanica, 20—30.
- MORUS.**
Alba, 30—40.
Nigra, 30—40.
- PINUS.**
Larex, 50—100.
Pendula, 30—40
Microcarpa, 30—40.
- PLATANUS.**
Occidentalis, 50—60.
Accrifolia, 50—60.
Orientalis, 20—30.
- POPULUS.**
Grandidentata, 20—30.
Trepida, 20—30.
Monilifera, 30—40.
Lævigata, 35—45.
Nigra, 35—45.
Hetrophylla, 20—30.
Pendula, 25—35.
Græca, 40—50.
Angulata, 45—55.
Alba, 50—60.
Tremula, 50—60.
Balsamifera, 25—35.
Dilatata, 50—60.
Canescens, 30—40.
Nivea, 30—40.
- PRUNUS.**
Domestica, 45—60.
Scrotina, 30—40.
Avium, 50—60.
Padus, 30—40.
Pensylvanica, 30—40.
Nigra, 20—30.
Cerasus, 40—50.
Insititia, 15—20.
- PYRUS.**
Angustifolia, 20—30.
Communis, 20—35.
Coronaria, 20—30.
Salicifolia, 20—30.
Spectabilis, 20—30.
Prunifolia, 20—30.
Malus, 20—25.
Aria, 35—40.

Tormalis, 40 to 50
 Aucuparia, 30—40.
 Hybrida, 30—40.
 Cydonia, 15—25.

QUERCUS.

Alba, 40—50
 Aquatica, 40—50.
 Candida, 40—50.
 Hetrophylla, 40—50.
 Lucombeana, 50—60.
 Coccinea, 50—60.
 Turneri, 50—60.
 Montana, 50—60.
 Falcata, 40—50.
 Robur, 40—50.
 Pedunculata, 50—100.
 Rubra, 40—50.
 Tinctoria, 40—50.
 Palustris, 50—70.
 Prinus, 50—60.

ROBINIA.

Pseudo-acacia, 40—50.
 Viscosa, 30—40.

SALEX.

Capera, 30 to 40.
 Triandria, 30—40.
 Amygdalina, 30—40.

SALISBURIA.

Adiantifolia, 20—30.

TILIA.

Alba, 30—40.
 Americana, 30—40.
 Platyphylla, 50—70.
 Microphylla, 30—40.

ULMUS.

Americana, 40—50.
 Pendula, 40—50.
 Alba, 40—50.
 Montana, 40—50.
 Suberosa, 40—50.
 Nemoralis, 40—50.
 Campestris, 50—80.

All of these will succeed well in any moderately good garden-ground. It is, however, of importance to their future welfare, that the ground be properly prepared for them, by being effectually drained, if at all wet, and trenched to the depth of two feet, or if to the depth of three, so much the better.

HARDY EVERGREEN TREES AND SHRUBS.

ACER.

Creticum, 2 to 4.

ANDROMEDA.

Pulverulenta, 2—4.
 Polifolia, *et var.* 1—2.
 Catesbæi, 1—2.
 Axillaris, 1—2.
 Coriacea, 1—2
 Acuminata, 2—4.
 Calyculata, *et var.* 1—2.

ARISTOTELIA.

Macqui.

ARBUTUS.

Unedo, *et var.* 4 to 10.
 Laurifolia, 4—10.
 Andrachne 4—7.
 Hybrida.
 Alpina.
 Uva-ursi

AUCUBA.

Japonica, 4—7.

ATRIPLEX.

Halimus, 4—7.
 Portulacoides, 1—3.

- BERBERIS.**
 Aquifolium
- BUDDLEA.**
 Globosa, 4 to 7.
- BUPLEURUM.**
 Fruticosum, 4—7.
- BUXUS.**
 Sempervirens.
 Balearica, 4—10.
- CERASUS.**
 Lauro cerasus, 15—20.
 Caroliniana.
 Lusitanica, 20—30.
- CISTUS.**
 Ladaniferus, 2—4.
 Laxus, 2—3.
 Latifolius, 2—3.
 Albidus, 1—2.
 Creticus.
 Candidissimus.
 Corbiensis.
 Hetrophyllus.
 Crispus, 1—2.
 Ineanus.
 Hirsutus.
 Monspelienis, 1—2.
 Vaginatius, 1—2.
 Parviflorus.
 Villosus, 2—3.
 Salvifolius, 2—3.
 Purpureus.
 Populifolius, 2—4.
 Longifolius.
 Ledon.
 Cyprius.
 Laurifolius, 2—4.
 Monspelienis, 1—2.
- CNEORUM.**
 Tricoecum, 1—2.
- CRATEGUS.**
 Pyracantha.
- PRÆSUS.**
 Sempervirens, 20—30.
 Thyoides, 25—30
 Lusitanica, 25—30.
- HNE.**
 Tarton-raira, 1—2.
 Collina, 2—4.
- Lauriola, 2 to 4.
 Pontica, 2—4.
 Oleoides, 1—2.
 Cneorum, *et var.* 6.
 Hybrida, 1—3.
- ERICA.**
 Australis, 1—3.
 Mediterranea, 1—4.
 Minima, 1—2.
 Arborea, 3—10.
 Carne, 1.
- ERIOBOTRYA.**
 Japonica, 2—7.
- EUONYMUS.**
 Americanus, 2—4.
- GAULTHERA.**
 Procumbens, 0—1.
 Shallon, 0.
- GENISTA.**
 Candicans.
- HELIANTHEMUM.**
 Umbellatum.
 Oeymoides.
 Canadense.
 Alpestre.
 Vineale.
 Canum.
 Tomentosum.
 Leptophyllum.
 Vulgare.
 Serpyllifolium.
 Surrejanum.
 Grandiflorum.
 Obscurum.
 Roseum.
 Versicolor.
 Hyssopifolium.
 Sulphureum.
 Vulgatum.
 Venustum.
 Canescens.
 Pilosum.
 Nummularium.
 Hispidum.
 Apenninum.
- IBERIS.**
 Sempervirens.
 Frutescens.

ILEX.

- Aquifolium, *et var.* 10 to 30.
- Cassine, 2—4.
- Opaca, 2—4.
- Perado, 2—4.

JUNIPERUS.

- Daurica.
- Sabina, 2—4.
- Glauca.
- Prostrata, 0—2.
- Communis, 10—20.
- Hibernica.
- Suecica, 10—20.
- Virginiana, 30.
- Phœnicea, 10—20.
- Lycia, 10—20.

KALMIA.

- Latifolia, 2—7.
- Nitida, 2—3.
- Angustifolia, 2—3.
- Glauca, 2—3.

LAURUS.

- Nobilis, 10—20.

LAVENDULA.

- Spica, 1—2.
- Latifolia, 1—2.

LEDUM.

- Palustre, 1.
- Latifolia, 1—2.
- Buxifolia, 0—1.

LIGUSTRUM.

- Lucidum, 2—7.

MAGNOLIA.

- Grandiflora, *et var.* 10—20.
- Longifolia, 10—20.

OXYCOCCOS.

- Palustris, 0.
- Macrocarpus, 0.
- Erythrocarpum.

PHILLYREA, (*now Olia.*)

- Latifolia, 2—10.
- Ilicifolia, 2—10.
- Obliqua, 2—10.
- Angustifolia, 2—7.
- Oleæfolia, 2—7.
- Lævis, 2—7.
- Media, 2—7.
- Pendula, 2—7.

PHLOMIS.

- Purpuria, 1 to 3.
- Lanata, 1—3.
- Fruticosa, 1—3.

PHOTINIA.

- Arbutifolia.
- Serrulata.

PINUS.

- Nigra, 45.
- Rubra, 30.
- Alba, 80.
- Pinea, 40.
- Cembra, 50.
- Sylvestris, 30—100.
- Laricio, 80.
- Pinaster, 60.
- Strobus, 100—150.
- Abies.
- Cedrus, 70—80.
- Picea.
- Canadensis, 40.
- Pichta.
- Balsamea, 50.
- Pumilio, 6.
- Inops, 40.
- Resinosa, 50.
- Palustris, 50.
- Halapensis, 25.
- Fraseri, 30.
- Taurica.
- Mitis.
- Serotina, 60.
- Clanbrassiliaua, 2—3.
- Lanccolata, 25.
- Pumila, 25.
- Tæda, 30.
- Variabilis, 35.
- Pungens, 40.
- Rigida, 50—70.

POLYGALA.

- Chamæ-buxus, 0.

PRINOS.

- Glaber, 2—3.

QUERCUS.

- Virens, 35.
- Ilex, *et var.* 35.
- Subur, 25.
- Coccifera, 30.

- Cerris, et var.* 60.
Laurifolia, 40.
Gramuntia, 25.
Ballota.
Esculus, 35.
Phellos, 35.
RHODODENDRON
Ferrugineum, 1 to 2.
Hirsutum, 1—2.
Catawbiense.
Ponticum, et var. 4—7.
Maximum, do. 4—7.
Camtschaticum.
Punctatum, 2—4.
Arboreum, 2—7.
Hybridum, 2—4.
Azaleoides, 1—3.
ROSMARINUS.
Officinalis, 1—4.
RUSCUS.
Aculeatus, 1—1½.
Laxus, 1—2.
Hypophyllum, 0—1.
Hypoglossum, 0—2.
Rasimosus.
SALSOLA.
Fruticosa, 1—2.
SALVIA.
Officinalis, 1—2.
SANTOLINA.
Chamæ-cyparissus.
- TAXUS.**
Baccata, 25 to 30.
Hibernica, 2—10.
Procumbens.
THUJA.
Occidentalis, 10—20.
Orientalis, 10—20.
Tartarica, 4—10.
Pyramidalis.
VACCINIUM.
Vitis-idaea, 0.
Buxifolium, 0.
Nitidum.
Crassifolium, 1—1½.
Myrsinites, 1—2.
VIBURNUM.
Tinus, 4—7.
Lucida, 4—7.
Strictum, 4—7.
Rugosum.
Cassinifolius, 2—6.
YUCCA.
Filimentosa, 1—2.
Stricta, 1—2.
Glauceseens, 1—2.
Angustifolia, 1—2.
Rufocincta, 1—2.
Obliqua, 1—2.
Superba, 2—6.
Concava, 1—2.
Gloriosa, 2—4.

HARDY SHRUBS,

WHICH THRIVE UNDER THE DRIP AND SHADE OF TREES.

DECIDUOUS.

- CORNUS.**
Alba.
Alternifolia.
Florida.
Sanguinea.
- CORYLUS.**
Avellana.
- DAPHNE.**
Mezereum.

DECIDUOUS—CONTINUED.

EUONYMUS.	ROSA.
Europeus.	Arvensis.
Latifolius.	Rubiginosa.
Angustifolius.	Canina.
HYPERICUM.	Sempervirens.
Hircinum.	RUBUS.
LIGUSTRUM.	Occidentalis.
Vulgare.	Odoratus.
LONICERA.	Villosus.
Symphoricarpus.	SAMBUCUS.
Tartarica.	Nigra.
Xylosteum.	Laciniata.
MESPILUS.	Racimosa.
Tomentosa.	SPIRÆA.
	Salicifolia.

EVERGREEN.

AUCUBA.
Japonica.
BUXUS.
Sempervirens, <i>et var.</i>
DAPHNE.
Laureola.
EPHEDRA.
Distachya.
Monostachya.
HYPERICUM.
Androsæmum.
Calycinum.
ILEX.
Aquefolia, <i>et var.</i>
LIGUSTRUM.
Vulgare <i>var. sempervirens.</i>
PRUNUS.
Lauro-cerasus.
Lusitanica.
VIBURNUM.
Tinus, <i>et var.</i>

CLIMBERS,

Which will grow under the drip of Trees.

CLEMATIS.
Vitalba.
HEDERA.
Helix, <i>et var.</i>
LONICERA.
Periclymenum.
ROSA.
Arvensis.
<i>Var. Scandens.</i>
VINCA.
Major.
Minor.
<i>Var. fol. variegata, &c.</i>

This is an extremely useful section of plants, both for the purpose of forming an agreeable underwood, and for hiding unpleasant objects in situations where few other plants would live.

HARDY SHRUBS,

OF RAPID GROWTH, CALCULATED TO PRODUCE
IMMEDIATE EFFECT, &c.

DECIDUOUS.

COLUTEA.
Arborescens.
Frutescens.
CORNUS.
Alba.
Florida.
Sanguinea.
CYTISUS.
Laburnum.
Sessilifolium.
LIGUSTRUM.
Vulgare.
PHILADELPHUS.
Coronarius.
ROSA.
Villosa.
Arvensis.
SAMBUCUS.
Nigra.
SPIRÆA.
Opulifolia.
Salicifolia.
SYRINGA.
Vulgaris.
VIBURNUM.
Opulus.

EVERGREENS.

CUPRESSUS.
Sempervirens.
ILEX.
Aquifolium.
JUNIPERUS.
Virginiana.
LIGUSTRUM.
Vulgaris var. Sempervirens.
MESPILUS.
Pyracantha.
QUERCUS.
Gramuntia.
PRUNUS.
Lauro-cerasus.
Lusitanica.
RHAMNUS.
Alaternus.
SPARTIUM.
Junceum.
TAXUS.
Baccata.
THUJA.
Occidentalis.
Orientalis.
ULEX.
Europeus.

These may be planted of a large size, and so disposed that they may be either taken up or cut down, as those of greater value advance.

HARDY SHRUBS,

For planting by the sides of Rivers or Ponds, or in marshy ground, where few others would thrive.

DECIDUOUS.

- ALNUS.
Pumila.
- BETULA.
Nana.
Pumila.
Siberica.
- DIRCA.
Palustrus.
- MYRICA.
Cerifera.
Gale.
- SALEX.
Most of the species.

EVERGREEN.

- LEDUM.
Palustr.
- ARBUTUS.
Unedo.
- RHODODENDRON.
Maximum.
Ponticum.
- EMPETRUM.
Nigrum.
- OXYCOCCUS.
Palustrus.
Macrocarpus.

HARDY DECIDUOUS FLOWERING SHRUBS.

- AMELANCHIER.
Vulgaris, 4 to 7.
Botryapium, 4—7.
- AMYGDALUS.
Nana, 2—4.
Pumila, 2—4.
Prosterata, 0—2.
- ANDROMEDA.
Globulifera, 2—4.
Paniculata, 2—4.
Undulata, 2—4.
Mariana, 0—2.
Cassinifolia, 2—4.
Dealbata, 2—4.
Froncosa, 2—4.
Pulverulenta, 2—4.
Racimosa, 2—4.
Arborea, 7—10.
- ARALIA.
Spinosa, 4 to 7.
- ARONIA.
Arbutifolia.
Floribunda.
Mclanocarpa.
- ARTAMESIA.
Absinthium, 1—2.
- ASIMINA.
Triloba.
- ASTRAGALUS.
Tragacanthus, 0—1.
- AZALIA.
Pontica, 4—7.
Var. *Albiflora*, 4—7.
Tricolor, 4—7.
Pallida, 2—4.

- Calendulacea, 2 to 4.
 Var. Grandiflora.
 Splendens.
 Triumphans.
 Flammea.
 Chrysolecta.
- Canescens, 2—4.
 Speciosa, 2—4.
 Var. Major.
 Undulata.
 Aurantia.
 Crispa.
 Ciliata.
- Muliflora, 2—4.
 Var. Alba.
 Albo-plena.
 Blanda.
 Coccinia.
 Florida.
 Pumila.
 Tricolor.
 Mirabilis.
 Carnea.
 Purpureo-plena.
 Rosea.
- Bicolor, 2—4.
 Viscosa, 2—4.
 Var. Odorata.
 Vittata.
- Arborescens, 4—7.
 Nitida, 2—4.
 Glauca, 2—4.
 Hispida 2—4.
- BERBERIS.**
 Vulgaris, 4—7.
 Chinensis.
 Siberica, 2—4.
 Canadensis, 4—7.
- BETULA.**
 Nana, 2—4.
 Pumila, 2—4.
- CARAGANA.**
 Arborescens, 7—10.
 Altagana, 2—4.
 Pygmæa, 0—1.
 Frutescens.
 Spinosa, 4—7.
 Chamlagu, 2—4.
 Redowskii, 1—2.
- Mollis,* 2 to 4.
 Halodendron, 4—7.
 Jubata, 2—4.
 Aranaria, 2—4.
 Microphylla.
 Grandiflora.
- CALYCANTHUS.**
 Florida, 2—4.
 Oblongifolius.
- CERASUS.**
 Nigra, 7—10.
 Padus, 10—20.
 Serotina, 7—10.
- CHIMONANTHUS.**
 Fragrans.
 Var. Grandiflora.
- COLUTEA.**
 Pocockii, 4—7.
 Nepalenses.
 Arborescens, 4—10.
 Cruenta, 2—4.
 Media.
- CORIARIA.**
 Myrtifolia, 2—4.
- CORNUS.**
 Florida, 2—4.
 Mascula, 7—10.
 Alternifolia, 7—10.
 Stricta, 7—10.
 Alba, 7—10.
 Sanguinea, 4—10.
 Sericia.
 Circinata.
 Paniculata.
- CORONILLA.**
 Emerus, 4—7.
- COTONASTER.**
 Affinis.
 Vulgaris, 2—4.
 Acuminata.
 Tomentosa, 4—7.
 Eriocarpa.
- CYTISUS.**
 Biflorus, 2—4.
 Purpureus, 2—4.
 Albus.
 Alpinus, 2—4.
 Nigricans, 2—.
 Patens, 2—4.

- Sessilifolius, 4 to 7.
 Scoparius, 2—4.
 Argentius, 2—4.
 Supinus, 0—2.
 Hirsutus, 2—4.
 Elongatus, 2—4.
 Calycinus, 2—4.
 Capitatus, 2—4.
- DAPHNE.**
 Mezereum, 2—4.
Var. flo. alba, 2—4.
 Altaica.
- DIERVILLA.**
 Pumilis, 2—4.
- DIOTIS.**
 Ceratoides.
- FLEAGNUS.**
 Europeus, 4—7.
 Latifolius, 4—7.
 Verrucosus, 4—7.
 Atropurpureus, 4—7.
- FOTHERGILLÆ.**
 Alnifolia, 2—4.
- GENISTA.**
 Triquetra, 2—4.
 Radiata, 2—4.
 Pilosa, 0—2.
 Procumbens, 1—2.
 Lusitanica, 2—4.
 Hispanica, 2—4.
 Germanica, 2—4.
 Anglica, 1—2.
 Sericea, 2—4.
 Siberica, 2—4.
 Tinctoria, 2—4.
 Florida, 2—4.
 Prosterata, 1—2.
 Diffusa, 1—2.
 Ovata, 1—2.
 Sagittalis, 0—1.
- GLEDITSCHIA.**
 Horrida, 5—10.
 Sinensis, 5—10.
- HALESIA.**
 Tetraptera, 4—7.
 Diptera, 4—7.
- HALIMODENDRON.**
 Argenteum.
- HAMAMELIS.**
 Virginica, 10 to 20.
- HELIANTHEMUM.**
 Canadense.
 Alpestre.
 Vineale.
 Canum.
 Tomentosum.
 Grandiflorum.
 Obscurum.
 Vulgare.
 Leptophyllum.
 Pilosum.
 Scryllifolium.
 Sarrejanum.
 Lineare.
 Nummularium.
 Mutabile.
 Roseum.
 Polifolium.
 Sulphurium.
 Hyssopifolium.
 Apenninum.
 Pulverulentum.
 Variegatum.
 Canescens.
 Venustum.
 Rhodanthum.
- HIBISCUS.**
 Syriacus, 2—4.
Var. Albo-plena.
Purpureo-pleno
Rubra.
Alba.
Purpureus.
- HIPPOPHÆ.**
 Rhamnoides, 10—20.
 Canadensis, 7—10.
- HYDRANGÆA.**
 Radiata, 4—7.
 Arborescens, 4—7.
- HYPERICUM.**
 Androsæmum, 4—7.
 Calycinum, 2—4.
 Prolificum, 2—4.
 Hircinum, 2—4.
- LAURUS.**
 Benzoin, 4—10.
 Sassafras, 4—10.

- LIGUSTRUM.
Vulgare, 7 to 10.
- LIQUIDAMBER.
Styraciflua, 10—20.
Imberbe, 10—20.
- LONICERA.
Alpigena, 4—7.
Cœrulea, 2—4.
Nigra, 2—4.
Tartarica, 2—6.
Pyrenaica, 4—7.
Xylosteum.
- MACLURA.
Aurantiaca.
- MAGNOLIA.
Macrophylla, 4—10.
Auriculata, 4—10.
Pyramidata, 4—10.
- MENZESIA.
Ferruginea, 2—4.
Globularis, 2—4.
- NYSSA.
Villosa.
Denticulata.
- ONONIS.
Fruticosus, 1—2.
- PÆONIA.
Moutan, 2—8.
Var. Papaveracea, 2—4.
Banksii.
Rosca.
- PALIURUS.
Virgatus, 4—10.
Aculeatus, 4—10.
- PHILADELPHUS.
Grandiflorus, 4—7.
Gracilis, 4—7.
Coronarius, 4—7.
Inodorus, 0—2.
- POTENTILLA.
Floribunda, 1—3.
Fruticosa, 1—3.
- PTELEA.
Trifoliata, 2—4.
- PUNICA.
Granatum, 2—4.
Var. flo. pleno.
- RHAMNUS.
Saxatilis, 0—2.
Frangula, 4 to 10.
Latifolius, 4—7.
- RHODODENDRON.
Dauricum, 2—4.
- RHODORA.
Canadensis, 2—4.
- RHUS.
Vernix, 4—7.
Elegans, 4—7.
Typhinum, 4—7.
Glabrum, 4—7.
Cotinus, 10—20.
Radicans, 2—4.
Copallinum, 4—7.
Toxicodendron, 4—10.
Aromaticum, 2—4.
- RIBES.
Floridum, 2—4.
Aureum, 2—4.
Alpinum, 2—4.
- ROBINIA.
Hispidata, 2—4.
- RUBUS.
Canadensis.
Odoratus.
- SOPHORA.
Japonica, 4—7.
- SPARTIUM.
Juncœum, 2—4.
Var. flo. pleno.
Multiflorum, 4—7.
- SPIRÆA.
Lævigata, 2—4.
Triloba, 2—4.
Bella, 2—4.
Tomentosa, 3—6.
Salicifolia, 3—6.
Hypericifolia, 3—6.
Crenata, 2—4.
Opulifolia, 4—6.
Chamædrifolium, 2—4.
Sorboifolia, 2—4.
- STAPHYLEA.
Trifolia, 4—7.
Pinnata, 4—7.
- SYMPHORIA.
Glomerata, 2—4.
Racimosa, 2—4.



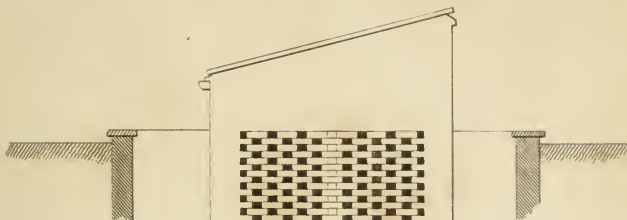
BRIDGMAN'S KIMBRANT.

A new Eye Feathered Double Tulip
brought by Mr. Edwards of Weymouth
in 1870. Raised by P. S. Barré.

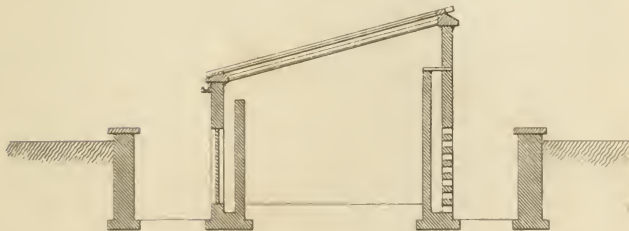


Succession Pine Pit

End Elevation



Gross Section





SYRINGA.

- Vulgaris, 4 to 7.
 Var. *Violacea*, 4—7.
Alba, 3—6.
 Chinensis.
 Persica, 2—4.
 Var. *Alba*.
Laciniata.

TAMARIX.

- Gallica, 2—4.
 Germanica, 2—4.

TAXODIUM.

- Distichum, 2—4.

ŪLEX.

- Europæus, 1—2.
 Var. *fl. pleno*.

VIBURNUM.

- Lautana, 7 to 10.
 Opulus, 7—10.
 Lavigatum, 7—10.
 Pubescens.
 Molle.
 Nudum, 2—4.
 Prunifolium, 4—7.
 Dentatum, 2—4.
 Nitidum, 2—4

VITEX.

- Agnus-castus, 10—15.

ZANTHORHIZA.

- Apiifolia, 0—1.

ZANTHOXYLUM.

- Tricarpum, 4—7.
 Fraxineum, 4—7.

Of these, the families of *Andromeda*, *Azalia*, *Rhodora*, *Rhododendron*, *Daphne*, *Menzesia*, *Magnolia*, and *Vaccinium*, require to be planted in bog or heath-mould; the remainder will succeed perfectly well, if planted in any moderately good garden ground.

 HARDY CLIMBERS.

AMPELOPSIS.

- Hederacea. (*white*)

ARISTOLOCHIA.

- Sipho. (*yellow*)
 Tomentosa.

ATRAGENE.

- Americana.
 Siberica. (*white*)
 Austriaca. (*blue*)
 Ochotensis.

BIGNONIA.

- Capereolata.
 Radicans. (*yellow*)

CELASTRUS.

- Scandens. (*white*)

CLEMATIS.

- Flamula.
 Orientalis. (*yellow*)
 Glauca.
 Chinensis.
 Vitalba. (*white*)
 Virginiana. (*red*)
 Tridentata. (*yellow*)
 Dahurica.
 Diversifolia.
 Viorna. (*red*)
 Cylandrica.
 Simsii.
 Reticulata. (*yellow*)
 Florida. (*white*)

- Var. *flera-pleno*. (*white*)
 Viticella. (*purple*)
 Var. *Purpuria*.
 Pulchella.
 Calycina.
 Crispa.
 Cirrhosa.
 Pedicellata.
- DECUMARIA.
- Barbata.
 Sarmentosa.
- HEDERA.
- Canadensis.
 Helix.
- JASMINUM.
- Humile. (*yellow*)
 Frutescens.
 Officinalis. (*white*)
 Revolutum.
- LONICERA.
- Chinensis.
 Dioica.
 Flava. (*yellow*)
 Caperifolium. (*yellow*)
 Sempervirens. (*red*)
 Pubescens.
 Implexa. (*red*)
 Grata. (*green*)
 Periclymenum. (*white*)
 Belgicum. (*white*)
- LYCIUM.
- Chinense.
 Barbatum. (*red*)
 Ruthenicum.
- MENISPERMUM.
- Virginicum. (*green*)
 Canadense. (*green*)
- PASSIFLORA.
- Cœrulea. (*blue*)
 Colvillii. (*blue*)
- PERIPLOCA.
- Græca. (*white*)
- ROSA.
- Multiflora. (*red*)
 Var. *Alba*. (*white*)
 Sempervirens. (*white*)
 Boursoulti. (*red*)
 Banksiæ.
 Hyacinthina.
- RUBUS.
- Laciniatus.
 Fruticosus. (*white*)
 Var. *flo. pleno*.
 fol. variegata.
- SMILAX.
- Aspera. (*green*)
 Caduca.
 Quadrangularis.
 Bona-nox.
 Laurifolia.
 Sarasaparilla. (*green*)
 Lanciolata.
- VITIS.
- Rotundifolia. (*green*)
 Vulpina. (*green*)
 Labrusca. (*green*)
 Riparia. (*green*)
 Laciniosa. (*green*)
- WENDLANDIA.
- Populifolia.
- WISTERIA.
- Chinensis.
 Frutescens. (*yellow*)

The object in view being generally to obtain a large size, so as to cover objects either vertical or horizontal; the soil, therefore, for climbing plants should be more carefully prepared than for those which compose the general mass of shrubs. A soil, prepared as follows, will be found to answer every expectation, supposing that all other circumstances prove favorable:— Fresh maiden loam of rather a light texture, bog or heath mould, each an equal portion; to which may be added, one-eighth of perfectly rotten dung.

FLOWER GARDEN HERBACEOUS PLANTS,

That will stand our Climate without Protection.

ACANTHUS.

Mollis.
 Spinus.
 Spinosissimus.
 Illicifolius.

ACONITUM.

Lycocotnum.
 Album.
 Variegatum.
 Japonicum.
 Uncinatum.
 Speciosum.
 Volubile.
 Exaltatum.
 Virgatum.
 Amænum.
 Formosum.
 Venustum.
 Pyramidale.
 Versicolor.
 Decorum.
 Lætum.
 Rubellum.

ACHILLEA.

Grandiflora.
 Ptarmica.
 Flore-pleno.
 Ageratum.
 Speciosa.
 Alpina.
 Serrata.
 *Clavennæ.
 Impatiens.
 Auria.
 Compacta.
 Asplenifolia.
 Nobilis.
 Rosea.
 Holosericea.

ADONIS.

Vernalis.
 Apennina.

AGROSTEMMA.

Coronaria.
 a *Pæmbra.*
 b *Alba.*
 c *Pleno.*

ALCHIMILLA.

*Pubescens.
 *Alpina.
 *Sericea.
 *Hybrida.

ALETRIS.

Auria.
 Farinosa.

ALYSSUM.

*Saxatile.
 *Orientale.
 *Argentium.
 *Obtusifolia.
 *Tortuosum.
 *Vernale.
 *Montana.

AMARYLLIS.

Belladonna.

AMMOBIUM.

Alatum.

AMSONIA.

Latifolia,[†]
 Salicifolia.
 Angustifolia.

ANCHUSA.

Paniculata.
 Italica.

Procera.

ANDROSACEA.

*Villosa.
 *Chamæjasme

*Lactea.

*Obtusifolia.

ANEMONE.

Coronaria.

a *Flore-pleno.*

Stellata.

Palmata.

Apennina.

Nemerosa.

a *Flore-pleno.*

Sylvestris.

Alba.

Dichotoma

Virginiana.

Pensylvanica.

Vid. Pulsatilla et Hepatica.

ANTIRRHINUM.

Majus.

a *Coccinia.*b *Bicolor.*c *Multipler.*

Angustifolium.

ANTHYLLIS.

*Montana.

*Alpina.

*Onobrychioides.

*Dillenii.

APOCYNUM.

Androsæmifolium.

Hypericifolium.

Venetum.

APIOS.

Tuberosa.

AQUILEGIA.

Vulgaris.

Canadensis.

Atropurpurea.

Viridiflora.

Viscosa.

Siberica.

Alpina.

Formosa.

Hybrida.

Glandulosa.

Pyrenaica.

ARABIS.

*Præcox.

*Ambigua.

*Alpina.

*Albida.

*Longifolia.

*Crispata.

*Muralis.

*Stricta.

*Procurrens.

*Petraea.

*a *Hispidæ.**b *Hastulata.*

*Lyrata.

*Stolonifera.

*Ovirensis.

*Lucida.

*Pumila.

*Bellidifolia.

*Cœrulea.

*Collina.

ARALIA.

Nudicaulis.

Racimosa.

ARETIA.

*Vitaliana.

*Alpina.

ARENARIA.

*Graminifolia.

*Longifolia.

*Formosa.

*Grandiflora.

*Ramosissima.

*Saxatilis.

*Balcarica.

*Montana.

*Multicaulis.

*Dahurica.

*Otitoides.

*Verna.

ARTEMISIA.

*Glacialis.

*Rupestris.

*Pedemontana.

*Caucasica.

*Spicata.

*Saxatilis.

*Glaucæ.

*Nivia.

*Sericea.

ASCLEPIAS.

Tuberosa.

Syriaca.

- Nivea.
 Incarnata.
 Rubra.
 Laurifolia.
 Amplicaulis.
 Obtusifolia.
 Amæna.
 Pulchra.
- ASPHODELUS.**
 Fistulosus.
 Ramosus.
 Creticus.
 Æstivus.
 Altaicus.
- ASTER.**
 *Alpinus.
 Pulchellus.
 Præcox.
 Blandus.
 Pulcherrimus.
 Tradescanti.
 Acuminatus.
 Eminens.
 Divergens.
 Pallens.
 Alwartensis.
 Undulatus.
 Altaicus.
 Spectabilis.
 Floribundus.
 Novi-belgii.
 Mutabilis.
 Elegans.
 Versicolor.
 Bellidiflorus.
 Cyaneus.
 Grandiflorus.
 Carolinianus.
 Novæ-angliæ.
 Amellus.
 Concolor.
 Multiflorus.
 Ericoides.
 Nemoralis.
 Canus.
- ASTRAGALUS.**
 *Hypoglottis.
 Leucophæus.
 Carnosus.
- *Alopecuroides.
 Alopecias.
 Tomentosus.
 *Tragacantha.
 Longiflorus.
 Excapus.
 *Gracilis.
 *Diffusus.
 Odoratus.
 *Montana.
 *Uralensis.
- ASTRANTIA.**
 Major.
 Carniolica.
 Caucasica.
 Maxima.
 *Minor.
- BELLIS.**
 *Sylvestris.
 *Perennis.
 *Hybrida.
- BELLIUM.**
 *Minutum.
- BOCCONIA.**
 Cordata.
- BORAGO.**
 *Laxiflora.
 Crassifolia.
 Orientalis.
- CALCEOLARIA.**
 *Fothergillii.
- CAMPANULA.**
 *Pulla.
 *Carpathica.
 *Rotundifolia.
 *Pumila.
 Neglecta.
 Linifolia.
 Caucasica.
 Persicifolia.
 a *Cærulea*.
 b *Alba*.
 c *Alba-pleno*.
 a *Cærulea-pleno*.
 Pyramidalis.
 Versicolor.
- *Nitida.
 a *Cærulea*.
 b *Alba*.

Latifolia.
 a *Alba*.
 Macrantha.
 Urticifolia.
 Infundibuliformis.
 Bononiensis.
 Aggregata.
 Speciosa.
 Multiflora.
 Collina.
 *Azurea.
 Lactiflora.
 Thyrsoides.
 Barbata.
 *Punctata.
 Betonicefolia.
 *Alpina.
 Alliariæfolia.
 Lamiifolia.
 Siberica.
 Lingulata.

CARDAMINE.

*Pratensis.
 **Flora pleno*.
 *Amara.
 *Rotundifolia.

CATANANCHE.

Cœrulea.

CENTAURIA.

Glastifolia.
 Alba.
 Macrocephala.
 Alata.
 Phrygia.
 Centaurium.
 Rivularis.

CERASTIUM.

*Grandiflorum.
 *Tomentosum.
 *Biebersteinii.
 *Lanatum.
 *Latifolium.
 *Alpinum.
 *Repens.
 *Suffruticosum.
 *Pubescens.

*Pilosum.

CHEIRANTHUS.

*Cheiri, *many varieties*
 *Alpinus.

CHELONE.

Grandiflora.
 Digitalis.
 Glabra.
 Obliqua.
 Lyoni.
 Rosea.
 Barbata.
 Campanulata.
 Lævigata.
 Pubescens.
 Cristata.

CHRYSANTHEMUM.

Atratum.
 Montanum.
 Arcticum.
 Paludosum.
 Rotundifolium.
 Sinense.

Indicum.—Of this very interesting species, the following are varieties, and have been chiefly introduced by the Hort. Soc.: *—

Old purple.
 Changeable white.
 Quilled white.
 Superb white.
 Tasselled white.
 Quilled yellow.
 Straw-colored.
 Golden yellow.
 Large lilac.
 Pink or lilac.
 Buff or copper-colored.
 Spanish brown.
 Quilled flame yellow.
 Quilled pink.
 Early crimson.
 Large quilled orange.
 Expanded light purple.
 Quilled light purple.
 Curled lilac.

* We have preferred giving the English names of the varieties of this species, as being more generally used.

- Superb clustered yellow.
 Semi-double quilled pink.
 Semi-double quilled white.
 Semi-double quilled orange.
 Late pale purple.
 Quilled salmon-colored.
 Small yellow.
 Paper-white.
 Pale pink.
 Tasselled yellow.
 Yellow Waratah.
 Golden Lotus.
 Double Indian yellow.
 Park's small yellow.
 Pale buff.
 Blush.
 Double Indian white
 Starry purple.
 Early blush.
 Brown purple.
- COLCHICUM.**
 Autumnale.
 Montanum.
 Arenarium.
- CONVALLARIA.**
 Majalis.
 a Alba.
 b Rosea.
 c Plena.
- CONVOLVULUS.**
 Holocericeus.
 Salvifolius.
 *Lineatus.
 Sibthorpii.
 Hirsutus.
 Tiliaceus.
- COREOPSIS.**
 Grandiflora.
 Verticillata.
 Tenuifolia.
 Auria.
 Discolor.
 Senifolia.
 Amplexicaulis.
 Palmata.
 Auriculata.
 Latifolia.
 Arguta.
 Lanciolata.
- Crassifolia.
 Angustifolia.
- CORONILLA.**
 *Iberica.
 *Coronata.
 *Cappadocica.
 *Varia.
- CORTUSA.**
 *Mathioli.
- CORYDALIS.**
 *Lutea.
 Uralensis.
 Glauca.
 Nobilis.
 Bracteata.
 Angustifolia.
 Bulbosa.
 Tuberosa.
- CROCUS.**
 Albiflorus.
 Biflorus.
 Vernus.
 Versicolor.
 Striatus.
 Pusillus.
 Nudiflorus.
 Susianus.
 Sativus.
 Stellaris.
 Reticulatus.
 Sulphureus.
 Mæsiacus.
 Lagenæflorus.
 Serotinus.
- CYCLAMEN.**
 *Cocem.
 *Vernum.
 *Europeum.
 *Hederæfolium.
 *Neapolitanum.
- CYNANCHUM.**
 Vincetoxicum.
 Fuscatum.
 Sibericum.
 Roseum.
 Acutum.
- CYPRIPEDIUM.**
 Arietinum.
 Spectabile.

- Calceolis.
 Pubescens.
 Humile.
 Parviflorum.
- DAHLIA.
Many varieties.
- DALIBARDA.
 *Repens.
- DELPHINIUM.
 Pictum.
 Speciosum.
 Laxiflorum.
 Intermedium.
 Grandiflorum.
 a *Album.*
 b *Flore-pleno*
 c *Chinense.*
 Puniceum.
 Hybridum.
 Fissum.
 Elegans.
 Tricorne.
 Amænum.
 Azureum.
 Exaltatum.
 Revolutum.
- DIANTHUS.
 Barbatus.
 a *Flore-pleno.*
 *Latifolius.
 *Capitatus.
 *Atrorubens.
 *Carthusianorum.
 *Polymorphus.
 *Collinus.
 *Campestris.
 *Alpestris.
 *Nitidus.
 *Guttatus.
 Versicolor.
 *Montanus.
 Caryophyllus.
 a *Flore-plenc.*
 b *Fruticosus.*
 c *Imbricatus.*
 Superbus.
 *Fragrans.
 Serotinus.
 *Arenarius.
- Fimbriatus.
 Hortensis.
 Squarrosus.
 *Petraeus.
 *Glacialis.
 *Alpinus.
 *Cæsius.
 *Deltoides.
 Pungens.
- DICTAMNUS.
 Albus.
 Fraxinella.
- DIGITALIS.
 Lutea.
 Media.
 Orientalis.
 Auria.
 Ferruginea.
 Ambigua.
 Fulva.
 Obscura.
- DODECATHEON.
 Media.
- DORONICUM.
 Caucasicum.
 Orientale.
- DORYCNIUM.
 Herbacium.
- DRABA.
 *Aizoides.
 *Stellata.
 *Hirta.
 *Alpina.
- DRYAS.
 *Octopetale.
- DRACOCEPHALUM.
 Nutans.
 Speciosum.
 Denticulatum.
 Sibericum.
 Virginianum.
 Palmatum.
 Botryoides.
 Austriacum.
 Ruyschiana.
- EPILOBIUM.
 Spicatum.
 Halleri.
 Latifolium.

- Coloratum.
 Angustissimum.
- ERIGENON.
 Grandiflorum.
 *Alpinum.
 *Uniflorum.
 *Villarsii.
 Caucasicum.
 Compositum.
 Carolianum.
 Nudicaule.
 Purpurium.
 Philadelphicum.
 Bellidifolium.
- ERINUS.
 *Alpinus.
 *Hispanicus.
- EREPETION.
 *Reniforme.
- ERODIUM.
 *Richardi.
 *Gussonii.
 *Hymenodes.
 *Serotinum.
 *Alpinum.
 Glaucophyllum.
 Malopoides.
- ERYNGIUM.
 Azureum.
 Bourgati.
 Maritimum.
 Alpinum.
 Amethystinum.
 Planum.
 Aquaticum.
 Cæruleum.
- FARSETIA.
 *Lunarioides.
- FRITILLARIA.
 Imperialis.
 Obliqua.
 Meleagris.
 Præcox.
 Latifolia.
 Lutea.
 Nervosa.
 Tenella.
 Nigra.
- Pyrenaica
 Persica.
 Pudica.
 Lanciolata.
- FRAGARIA.
 *Indica.
- GALARDIA.
 Bicolor.
 Aristata.
- GALANTHUS.
 Nivalis.
- GALAX.
 *Cordifolia.
- GALIGA
 Officinalis.
 a *Cærulea*.
 b *Alba*.
- Biloba.
 Persica.
 Orientalis.
- GENTIANA
 Lutea.
 *Ciliata.
 *Verna.
 Baverica.
 *Pumila.
 Pyrenaica.
 *Aculus.
 Purpuria.
 Punctata.
 *Septemfida.
 Cruciata.
 Asclepedia.
 Saponaria.
 *Gelida.
 Intermedia.
 Incarnata.
 Catesbæi.
 Ochroleuca.
 Peumonanthe.
 Macrophylla
- GERANIUM.
 *Sanguineum
 *Argenteum.
 Anemonefolium.
 Macrorhizon.
 Ibericum.
 *Wallichianum.
 Angulatum.

- Pratense.
 a *Album*.
 b *Flore-pleno*.
- GLADIOLUS.
 Byzantinus
 Communis.
- GLOBULARIA.
 *Vulgaris.
 *Cordifolia.
 *Bellidifolia.
 *Nudicaulis.
 *Nana.
 *Linifolia.
- GLAUCIUM.
 *Fulvum.
 *Flavum.
- GYPSOPHILA.
 *Altissima.
 *Fastigata.
 *Perfoliata.
 *Acutifolia.
 *Paniculata.
 *Steveni.
 *Glomerata.
 *Saxifraga.
 *Repens.
 *Adsendens.
 *Rigida.
 *Prosterata.
- HEDYSARUM.
 Grandiflorum.
 Candidum.
 Serotinum.
 Paniculatum.
 Viridiflorum.
 *Obscurum.
 Canadense.
 Obtusum.
 Carneum.
 *Humile.
 *Roseum.
 *Alpinum.
- HELIANTHUS.
 Multiflorus
Flore-pleno.
 Atrorubens
 Trilobatus.
 Parviflorus.
 Excelsus.
- Decapetalus.
 Altissimus.
 Longifolius.
- HELLEBORUS.
 Niger.
 Viridis.
 Atrorubens.
 Dumetorum.
 Lividus.
 Purpurascens.
- HEPATICA.
 Triloba.
 a *Cœrulea*.
 b *Cœrulea-plena*.
 c *Rubra*.
 d *Rubra-plena*.
 e *Alba*.
 f *Nivia*.
- HELONIAS.
 Bullata.
 Erythrosperma.
 Angustifolius.
- HESPERIS.
 Matronalis.
 a *Albiflora*.
 b *Albo-plena*.
 c *Purpuria*.
 d *Purpurio-plena*.
 e *Variiegata*.
 d *Folii-flora*.
- Fragrans.
- HEMEROCALLIS.
 Flava.
 Fulva.
 Graminia.
 Disticha.
- HOUSTONIA.
 *Cœrulea.
 Purpuria.
- HYACINTHUS.
 Orientalis.
 a *Cœruleus*.
 b *Ruber*.
 c *Flavus*.
 d *Multiplex*.
 e *Plenus*.
 f *Albus*.
 g *Semiplenus*.
- Amethystinus.

HYPERICUM.

- Elegans.
- Maculatum.

IBERIS.

- *Saxatiles.
- *Corifolia.
- *Sempervirens.
- *Tenoreana.
- *Pubescens.

ILLECEBRUM.

- *Verticillatum.

IRIS.

- Susiana.
- Florentina.
- Germanica.
- Pallida.
- Flavessens.
- Sambucina.
- Squalens.
- Lurida.
- Cristata.
- Fimbriata.
- Flavissima.
- Pumila.
- Versicolor.
- Fulva.
- Spuria.
- Desertorum.
- Verna.
- Hæmatophylla.
- Xiphium.
- Xiphioides.
- Humilis.
- Nepalensis.
- Flexuosa.
- Prismatica.

JASIONE.

- *Montana.
- *Perennis.

LATHYRUS.

- Grandiflorus.
- Attenuatus.
- Tenuifolius
- Latifolius.
- Hetrophyllus.
- Incurvus.
- Polymorphus.
- Venosus.

LIATRIS.

- Spicata.
- Pycnostachya.
- Paniculata.
- Squarrosa.
- Intermedia.
- Pilosa.
- Gracilis.
- Scariosa.
- Elegans.
- Sphæroidea.
- Turbinata.

LINUM.

- *Flavum.
- *Alpinum.
- *Diffusum.
- *Montanum.

LILIUM.

- Candidum.
- Tigrinum.
- Canadense.
- Philadelphicum.
- Catasbæi.
- Longiflorum.
- Japonicum.
- Carolinianum.
- Pumilum.
- Martagon.
- Superbum.
- Glabrum.
- Pomponium.
- Monadelpum.
- Pyrenaicum.
- Croceum.
- Latifolium.
- Spectabile.

LINARIA.

- *Cymbalaria.
- *Pilosa.
- *Alpina.
- Genistifolia.
- Linifolia
- Vulgaris.
- Piloria.*

LOBELIA.

- *Erinus.
- *Amcena.
- Syphilitica.

- Cardinalis.
 Splendens.
 Fulgens.
LUPINUS.
 Arboreus.
 Mutabilis.
 Mexicanus
 Perennis.
 Nootkatensis.
LYCHNIS.
 Chalcedonica.
 a *Flora-pleno.*
 b *Albiflora.*
 Coronata.
 Fulgens.
LYTHRUM.
 Diffusum.
 Virgatum.
 Lineare.
LYSIMACHIA.
 Verticillata.
 *Nummularia.
 *Nemorum.
 Punctatum.
 Ciliata.
 Stricta.
 Ephemereum.
MIMULUS.
 *Guttatus.
 Ringens.
 Alatus.
MONARDA.
 Media.
 Didyma.
 Russelliana.
 Purpuria.
MUSCARI.
 Botryoides.
 a *Azureum.*
 b *Pallidum.*
 c *Album.*
 Moschatum.
 Comosum.
NARCISSUS.
 Moschatus.
 Pseudo-narcissus.
 Minor.
 Tenuifolius.
 Aurantius.
 Incomparabilis.
 Floribundus.
 Poeticus.
 Tazetta.
 Jonquilla.
 a *Flora-pleno.*
 Multiflorus.
ONONIS.
 Picta.
 Antiquorum.
OROBUS.
 Lathyroides.
 Vernus.
 Albus.
 Varius.
 Niger.
 Sessilifolius.
 Tenuifolius.
ORNITHOGALUM.
 Fimbriatum.
 Pyramidale.
 Japonicum.
PÆONIA.
 Moutan.
 a *Papaveracea.*
 b *Banksii.*
 c *Rosea.*
 Officinalis.
 a *Rosea.*
 b *Albicans.*
 c *Sabini.*
 d *Blanda.*
 e *Carnescens.*
 f *Rubra.*
 Edulis.
 a *Humei.*
 b *Whiteji.*
 c *Candida.*
 d *Tartarica.*
 e *Albiflora.*
 f *Vestalis.*
 g *Siberica.*
 h *Rubescens.*
 i *Uniflora.*
 j *Fragrans.*
 Tenuifolia
 Hybrida.
 Corallina.
 Daurica.

- ANOMALA.**
Laciniata.
 Paradoxa.
 Pubens.
 Humilis.
 Lobata.
 Russi.
 Decora.
 Cretica.
 Peregrina.
 Mollis.
- PAPAVER.**
 Orientale.
 Bracteatum.
 Microcarpum.
 *Alpinum.
 *Nudicaule.
- PHLOX.**
 Divericata.
 Suaveolans.
 Ovata.
 *Reptans.
 Carolina.
 Paniculata.
Alba.
 Undulata.
 Acuminata.
 Maculata.
 Triflora.
 Pyramidalis.
 *Amœna.
 *Subulata.
 *Nivalis.
 *Setacea.
 Virginica.
 Intermedia
- PHYTEUMA.**
 Orbiculare
 Elipticum
 Comosum.
 Campanuloides.
- POLEMONIUM.**
 Cœrulium.
Flore-albo.
 Mexicanum.
 Sibericum.
 Reptans
- POTENTILLA.**
 *Splendens
 *Sericia.
- *Aurea.
 *Formosa.
 *Atro-sanguinea.
 *Grandiflora.
 *Opaca.
- PRIMULA.**
 Acaulis.
 a *Albo-plena.*
 b *Sulphureo-plena.*
 c *Cupreo-plena.*
 d *Salmonco-plena.*
 e *Lilacino-plena.*
 f *Rubro-plena.*
 g *Purpureo-plena.*
- Elatior.
Polyantha.
 Auricula.
 Marginata.
 Farinosa.
 Palinuri.
- PULMONARIA.**
 Mollis.
 Officinalis.
 Grandiflora.
- PYRETHRUM.**
 Grandiflorum.
 Roseum.
- PULSATILLA.**
 Vulgaris.
 Alpina.
 Halleri.
- RANUNCULUS.**
 Aconitifolius.
 Platanifolius.
 Amplexicaulis.
- RHEXIA.**
 *Mariana.
 *Virginica.
- SANGUINARIA.**
 Canadensis.
- SALVIA.**
 Interrupta.
 Nubicola.
 Tenorii.
 Triloba.
- SAXIFRAGA.**
 *Crassifolia.
 *Cordifolia.
 *Ligulata.
 *Geum.

- *Dentata.
 *Serrata.
 *Sarmentosa.
 *Erosa.
 *Granulata.
Flora-plen
 *Aizoides.
 *Hieracifolia.
 *Pensylvanica.
 *Colyledon
 *Lingulata.
 *Aizoon.
 *Oppositifolia.
 *Geranioides
 *Irrigua.
 *Ceratophylla.
 *Moschata.
 *Hypnoides.
- SEDUM.
 *Aizoon.
 *Populifolium.
 *Reflexum.
 *Acre.
 *Dasyphyllum.
 *Glaucum.
 *Hybridum.
- SEMPERVIVUM.
 *Tectorum.
 *Grandiflorum.
 *Montanum.
- SPIRÆA.
 Filipendula.
 Digitata.
 Palmata.
 Lobata.
 Ulmaria.
 Aruncus.
- S FIGELIA.
 Marylandica.
- STATICE.
 Dianthoides.
 Vulgaris.
 Latifolia.
 Plantaginea.
- STIPA.
 Pinnata.
- TIGRIDA.
 Pavonia.
 Conchiiflora.
- TRACHELIUM.
 Cœrulia.
- TRADESCANTIA.
 Subaspera.
 Virginica.
 Rosea.
- TRILLIUM.
 Sessile.
 Grandiflorum.
 Erythrocarpum.
 Ovatum.
- TRITOMIA.
 Uvaria.
 Media.
- TROLLIUS.
 Europeus.
 Asiaticus.
- TULIPA.
 Gesneriana.
 Sylvestris.
 Suaveolens.
 Præcox.
- UVULARIA.
 Grandiflora.
 Perfoliata.
 Sessilifolia.
- VALERIANA.
 Rubra.
- VERATRUM.
 Nigrum.
 Viridum.
- VERBENA.
 Sororia.
- VERONICA.
 Neglecta.
 Latifolia.
 Incana.
 Elegans.
 *Fruticulosa.
 *Saxatilis.
 Arguta.
 Gentianoides.
 Laciniata.
 Elatior.
 Azuria.
 Virginica.
 Media.
 Paniculata.

Glabra.	*Pedata.
Spicata.	Odorata, <i>et var.</i>
VINCA.	Eriocarpa.
Herbacia.	Pubescens.
Minor, <i>et var.</i>	*Cornuta.
Major.	*Altaica.
VIOLA.	Pilosa.
Cucullata.	Lutea.
*Multifida.	Tricolor.
Variegata.	*Saxatilis.

Those marked (*) are rock-plants; that is, such as are generally cultivated upon banks of rock-work.

BIENNIAL FLOWER GARDEN PLANTS.

AGROSTEMMA.	CAMPANULA.
Coronaria.	Media.
<i>Var. flo. albo.</i>	<i>Var. flo. albo.</i>
<i>Flo. pleno rub.</i>	Obliqua.
Flos-jovis.	Americana.
ANTIRRHINUM.	Cervicaria.
Bellidifolium.	Multiflora.
Majus.	Thyrsoidea.
<i>Var. flora-pleno.</i>	Betonicefolia.
<i>Fol. Variegata.</i>	Spicata.
<i>Flo. lutea.</i>	Divergens.
<i>Flo. albo.</i>	Lanuginosa.
ADLUMIA.	CELSIA.
Cirrhosa.	Cretica.
ALTHÆA.	Lanciolata.
Rosea, <i>et var.</i>	DELPHINIUM.
Striata.	Pictum.
Pallida.	DIANTHUS.
ALYSSUM.	Chinensis.
Sinuatum.	<i>Var. flo-pleno.</i>
ANCHUSA.	DIGITALIS.
Italica.	Purpuria.
BORAGO.	<i>Var. flo. albo.</i>
Laxiflora.	ERYTHROLÆNA.
BERTEROA.	Conspicua.
Incana.	

ERIGERON.	Præcox.
Acris.	LAVATERA.
Hetrophyllum.	Arborea.
GAURA.	Biennis.
Biennis.	LINUM.
Mutabilis.	Strictum.
GLAUCIUM.	VERBASCUM.
Flavum.	Formosum.
IBERIS.	Niveum.
Linifolia.	Macranthum.
Ciliata.	Spectabile.
Taurica.	Elongatum.
Nana.	Rotundifolium.
ISATIS.	
Tinctoria.	

HARDY ANNUALS

ADONIS.	BALSAMINA.
Autimnalis.	Capensis.
Flava.	Chinensis.
Flammea.	Bifida.
AGERATUM.	CARTHAMUS.
Mexicanum.	Tinctorius.
Cœruleum.	CALENDULA.
Strictum.	Officinalis.
Latifolium.	<i>Var. flora-plena.</i>
ARGIMONE.	Pluvialis.
Mexicana.	Hybrida.
Albiflora.	Stellata.
ANAGALLIS.	CENTAURIA.
Cœrulea.	Suaviolens.
Indica.	COLLINSIA.
Arvensis.	Verna.
Carnea.	CLEOME.
AMARANTHUS.	Pubescens.
Hypochondriacus.	Violacia.
Caudatus.	Diffusa.
Speciosus.	Vergata.
Tristis.	COREOPSIS.
Bicolor.	Tinctoria.
Albus.	

- CONVOLVULUS.**
 Tricolor.
 Elongatus.
 Siculus.
 Undulatus.
- DATURA.**
 Ferox.
 Tatula.
 Muricata.
 Quercifolia.
 Stramonium.
- DELPHINUM.**
 Ajacis.
 Var. flo. pleno.
 Consolida.
 Var. flo. pleno.
 Aconiti.
- DIANTHUS.**
 Prolifer.
 Armeria.
- DRACOCEPHALUM.**
 Canescens.
- ECHIUM.**
 Austerale.
- FUMARIA.**
 Capreolata.
 Spicata.
 Densiflora.
- GALINSOGEA.**
 Trilobata.
 Balbisioides.
- GLAUCIUM.**
 Corniculatum.
 Var. flaviflorum.
- HELIOPHILA.**
 Diffusa.
 Digitata.
 Pectinata.
- HELIANTHEMUM.**
 Plantagineum.
 Guttatum.
 Villosum.
 Punctatum.
- HELIANTHUS.**
 Annuus.
 Indicus.
 Tubæformis.
- HYOSCYAMUS.**
 Agrestis.
 Pallidus.
 Albus.
- HYPECOUM.**
 Procumbens.
- IBERIS.**
 Umbulata.
 Odorata.
 Pinnata.
- IMPATIENS.**
 Biflora.
 Pallida.
 Noli-tangere.
- ISOTOMA.**
 Axilaris.
- IPOMÆA.**
 Luteola.
 Hederacea.
 Cuspidata.
 Barbigeræ.
 Purpuria.
- KAULFUSSIA.**
 Amelloides.
- LAVATERA.**
 Trimestris.
 Punctata.
 Lanciolata.
- LEONURUS.**
 Hetrophyllum.
 Multifedus.
- LOPEZIA.**
 Coronata.
 Pumila.
- LOBELIA.**
 Inflata.
- LINUM.**
 Gallicum.
 Aureum.
 Rigidum.
- LINARIA.**
 Bipartita.
- LUPINUS.**
 Pilosus.
 Hirsutus.
 Varius.
 Luteus.

- MATHIOLA.
 Annua, *et var.*
 Tricuspidata.
 Longipetala.
- MALVA.
 Mauritiana.
- MALOPE.
 Trifida.
- MONOPSIS.
 Conspicua.
- NEMOPHILA.
 Phacelioides.
- NICOTIANA.
 Tabacum, *et var.*
 Latissima.
 Rustica.
 Glutinosa.
- NIGELLA.
 Hispanica.
 Damascena.
Var. flo. pleno.
 Orientalis.
- NOLANA.
 Prosterata.
 Paradoxa.
- ONONIS.
 Diffusa.
- ŒNOTHERA.
 Sinuata.
 Striata.
 Tetraptera.
 Pinnatifida.
 Tenella.
 Purpuria.
- PAPAVER.
 Argemone.
 Somniferum, *et var.*
 Caucasicum.
 Horridum.
 Setigerum.
- PRISMATOCARPUS.
 Nitidus.
 Speculum.
- Pentagonius.
 Hirsatus.
- RICHARDSONIA.
 Scabra.
- RESEDA.
 Odorata.
- SCHIZANTHUS.
 Pinnatus.
 Porrigens.
- SENECIO.
 Elegans, *et var.*
- SILENE.
 Rubella.
 Quadridentata.
 Longicaulus.
 Pendula.
 Ciliata.
 Vespertina.
 Picta.
 Armeria.
- TAGETES.
 Corymbosa, *et var.*
 Tenuifolia.
 Glandulosa.
 Patula.
 Erecta.
 Minuta.
- TROPEOLUM.
 Minus.
 Majus.
- VIOLA.
 Prosterata.
 Tricolor, *et var.*
- XERANTHEMUM.
 Annuum.
 Orientale.
 Inapertum.
- ZINNIA.
 Pauciflora.
 Multiflora.
 Elegans.
 Angustifolia.
 Tenuifolia.

THE
GREEN-HOUSE AND CONSERVATORY.

INTRODUCTION.

THE green-house and conservatory may be defined to be garden structures, dedicated to the exclusive cultivation of ornamental plants, and are considered as the highest grade of horticultural erections. The former is distinguished from the latter by having all the plants portable, and generally placed on stages; whereas, in the latter, the major part are planted out permanently in beds or borders prepared for them. In the former, the plants are for the most part kept small, and in a flowering state, by frequent propagations; the end in view being more the production of abundant bloom than a display of the natural characters of the plants. In the latter, the natural habits of many plants may be developed, while at the same time the eye is delighted with a profusion of blossom in all its natural splendor, and the air perfumed with exotic fragrance. The former of these structures is by far the most ancient, and was known in this country in the seventeenth century, or even before that date. The latter is, however, of far more modern date, and, as a prominent character, possesses the advantage of being constructed on a more extended scale. Indeed, so much so, that several acres might be covered with glass, and specimens of that scenery displayed at home, which can only be enjoyed by those who visit more temperate climates. Several structures of considerable magnitude have been erected in this country; and one attempt, which unfortunately failed, (we mean the projected oriental garden at Brighton,) of carrying this species of building to its greatest

extent, would have furnished us with an example of how far this idea is capable of being carried.

Like all other structures for the habitation of plants, much has been said regarding their construction, in reference to their extent, form, the materials of which they should be formed, &c.

Of the latter, we have already, in the Introduction to the Forcing Garden, given our opinion in favor of wood superior to that of any other substitute hitherto used; we will, therefore, now proceed to consider their situation, construction, &c.

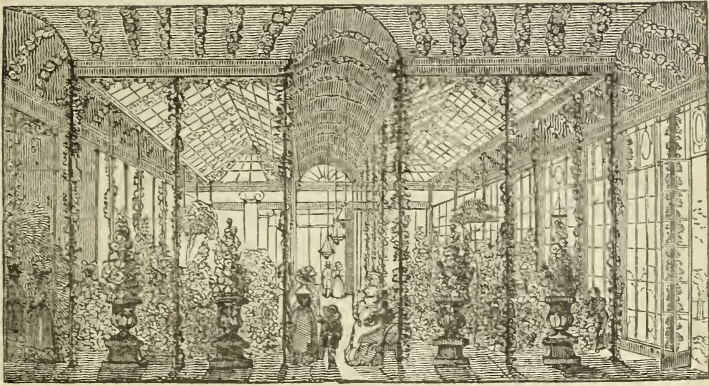
SITUATION OF THE CONSERVATORY.

The conservatory is sometimes placed in the pleasure ground, either attached to other hot-houses, or wholly apart, as the large dome-house at Britton-Hall, the seat of Col. Beaumont; and it is sometimes attached to the mansion, as at the Grange, the seat of A. Baring, Esq., M.P., where it may be said to form a part, both ornamental and useful. When attached to the mansion, it forms a lounge or promenade, at such seasons as the proprietor or his family could not so conveniently reach it, if situated at a distance; and it not unfrequently occurs, that it may be placed at certain points of a mansion with considerable architectural effect, as in the case last alluded to.

Whether the conservatory be placed immediately joining the house, or detached, it is important for the welfare of the plants cultivated in it that the situation be good, as far as regards exposure to the sun; for although the majority of exotic plants will thrive with a much less portion of sun-shine than is willingly allowed by many, still, when all circumstances will admit of it, a southern exposure is to be preferred.

The annexed engraving is a sketch of the conservatory above alluded to, the roof of which is wholly composed of metal and glass, the lights of wrought-iron rims and copper bars, being supported by cast-iron rafters, communicating with gutters or spouts of the same materials. This magnificent structure is about one hundred feet in length by fifty in breadth, the original design of which was furnished by C. P. Cockerell,

Esq., and erected by Messrs. Jones and Clark, of Birmingham.



SITUATION OF THE GREEN-HOUSE.

We perfectly agree with Nicol, that this structure should be placed in the shrubbery or flower garden, and not, as it is generally to be found, in the kitchen garden, combined with the forcing-houses. Neither should the green-house, excepting in small places, be attached to the house. The most eligible situation for a green-house is certainly in the flower garden or pleasure ground, and its exposure may be to the south, east, or west, with little difference to the plants; for, with the exception of those of the most delicate constitutions, they will prosper equally well should the house front either of those points, provided all the other points of culture be equally good: a green-house having a northern exposure would even have its advantages. *Camellias* and many other plants are found to succeed best in such situations; and it is well known, and easily accounted for, that plants in flower will retain their bloom much longer in a house so situated, than in one fully exposed to the sun.

Where the collection to be cultivated is intended to be considerable, it will be found most desirable to have two houses, even though smaller, than one very large house. The one to be exposed to the south, and the other may be either to the east,

west, or north. In the former may be cultivated all tender and delicate plants, particularly those denominated Cape plants, such as *Ericas*, *Pelargoniums*, *Diosmas*, &c., which prosper in a full exposure to the sun. In the latter may be cultivated *Cryptogamous* plants, and the majority of New-Holland plants, with thick or coriaceous leaves, &c.; and during the period when almost all plants are in flower, the latter will be found the most suitable for them, as their flowers will continue in perfection much longer in such, than in one which is more exposed to the sun. The latter will also be found extremely useful during summer, when the generality of green-house plants are taken out of the houses for the reception of some of the more delicate *Ericas*, *Helichrysum*, *Epacris*, and some other tender species, that are found not to succeed well when turned out in the open air.

ON THE CONSTRUCTION OF THE CONSERVATORY.

It has been justly observed by one of our best practical writers on this subject, that in the construction of plant-houses, fancy may be indulged in, and a greater scope may be allowed to the taste than in the construction of forcing-houses, where one object is only in view, viz. the production of certain fruits to the utmost possible degree of perfection.

In the construction of all habitations for plants which are designed for ornamental purposes, elegance of design should not be lost sight of; and while the conservatory admits a sufficiency of light and the proper means of admitting air in abundance, the latter of which is of much importance, the size and form may be such as to harmonize with the other parts of the mansion, or taste of the owner. In the construction of the conservatory, the artist may display much architectural taste, without rendering the house by any means unfit for plants; and those structures which are erected without a considerable share of such taste, will always appear puerile and mean. That taste may be here indulged in without injury, is evident from the variety of structures of this kind erected upon different principles; and in such we have often observed the success in the cultivation to depend more upon the ma-

nagement of the plants afterwards, than upon any particular style of the building, although it must be admitted that some houses of this kind are very defective. It is, however, always advisable, where circumstances will admit of it, to have all the sides of the house of glass, or nearly so; but as it is seldom the case, where the conservatory forms part of, or is attached to the mansion, that this can be attained; in such cases, therefore, one of the sides may be opaque, as in the case of our plate, (*see Plate,*) which represents a beautiful structure of this sort, built from the design of W. Atkinson, Esq. for P. C. Labouchere, Esq., at his seat, Highlands, near Chelmsford.

Conservatories have hitherto, for the most part, been fixed structures; portable houses, however, of this sort, have their advantages, excellent specimens of which may be seen at Cowes Castle, in the Isle of Wight, the seat of Julius Nash, Esq., where, in summer, the glass doors and lights are removed, leaving the plants to the enjoyment of free air, rain, and sun, whilst the skeleton of the structure forms a beautiful architectural piazza of considerable length. Other specimens occur, where the whole house is removed, and the beds, flues, and walks turfed over, presenting an exotic shrubbery in a perfectly novel point of view. This has been long exemplified at Nuneham Courtenay, in the case of an old orange-house situated in the flower garden, which is thus annually removed, and treated in the manner above alluded to.

In whatever style the conservatory may be designed, in regard to form, &c., it is of the utmost importance to the welfare of the plants intended to be cultivated in it, that the bottom be rendered perfectly dry by draining; and this is the more necessary, as not only the natural damp of the situation has to be guarded against, but also the superabundant supplies of water that may from time to time be applied, provision for which should be carefully and effectually made in the first erection, as it cannot be effected afterwards without much inconvenience: and unless the bottoms of the borders be rendered capable of being kept dry, little success will attend the cultivation of the inmates.

Ventilation is also of the utmost importance for the purpose of keeping the plants in a healthy state, and to prevent them

being drawn up slender, and after a time rendered naked of branches near their bottoms. If all the sashes be not made moveable, which would be advisable, it is particularly necessary that the greater part should be so made, as no means of ventilating are capable of affording air in sufficient abundance to such houses, where the sashes are entirely fixed. This is one principal objection to curvilinear-roofed houses, which can never be rendered sufficiently water-tight where the roof-sashes are moveable, without incurring an expense, which can never be balanced by any real merit that they may be supposed to possess. To those, however, who give a preference to them, we cannot recommend a better constructed roof than that called the *polyprosopic*, which is thus described by Mr. Loudon, in the *Encyclopedia of Gardening*:—"The polyprosopic roof resembles a curvilinear house, but differs in having the surface thrown into a number of faces, the chief advantages of which are, that by hinging all the different faces at their upper angles, and by having rods connecting the lower outside corners of the faces terminating in chains, which go over pullies in the top, or above the back wall, the whole roof, including the ends, may be raised sympathetically, like Venetian blinds, either so as each sash or face may be placed in the plane of the angle of the sun's rays at the time, or to the perpendicular to admit a shower of rain. In consequence of this arrangement, the plants in a polyprosopic house may at any time, and in a few minutes, be placed in effect, or, as far as respects light, air, wind, rain, dew, &c., in the open air; and being so placed, may, whenever desired, be as speedily restored to their proper climate." With all the advantages above stated, and important ones they are to a certainty, still the expense of erecting so complicated a system of moveable sashes, chains, &c., must be great, independently of the liability of their getting out of proper repair, or not acting in concert.

Air in sufficient abundance can be much more economically supplied, when the sashes of any formed house (curvilinear ones excepted) are made completely moveable, and let down by means of chains, or lines fixed to the top rails of each, or every other sash, and run over a pulley fixed in the back wall,

so as to admit of the sash sliding down its whole length over the one immediately below it; and admitting that every alternate top sash be thus let down, and the next bottom sash to it, let down its whole length, resting by its top rail upon the front of the house, where the front does not exceed four or five feet in height, and the bottom rail on the ground; by this means, the half of the entire roof surface will be, with little trouble, and at a comparatively trifling expense, exposed to the rain, dew, air, &c. When the front is of greater height, as is most generally the case with conservatories, then, instead of letting down the bottom sash to the ground, they may be drawn up under the top sash immediately above it, by similar means to that by which the top ones are let down. When ventilation is not to be given to its fullest extent, then the sashes may be let down to any given degree in the same manner, and having them (as a security against accidents by slipping down) secured by spring catches fixed to the side rail of the sash, and corresponding notches in the side of the rafters. Conservatories are in general loftier than any other species of hot-house, excepting those which are intended for the cultivation of palms, or similar tropical plants, which require much room. They, therefore, of themselves present very ample means of ventilation, as all the sides and ends, that are made of glass, may be so contrived as to be either removed or air admitted by half their surface, by opening the sashes in such a way as those that are fully open may cover those that remain shut; and, in addition to this, such parts of their sides as are opaque, when it does not break in on any other arrangement, may be ventilated either by glass windows or by wooden ventilators, upon the principle of those already recommended, and so placed as to suit existing circumstances. Ornamental brass ventilators, having an expanding orifice upon the outside, may be introduced into the walls when building, and may be opened or shut at pleasure; and probably they may be less objectionable in their appearance than those constructed of wood, as recommended for the culinary hot-houses.

The plants which most generally enter into the conservatory, are such as are capable of withstanding a considerable degree of cold, being for the most part natives of the Cape, New-

Holland, and such like temperatures. Fire-heat is therefore seldom required, excepting in times of frost; and indeed a greater degree of injury generally attends the application of too much fire-heat than the want of it, in the cultivation of green-house and conservatory plants. It is, however, necessary, that sufficient means be taken in the erection to enable the cultivator to apply it at his own discretion.

Fire-flues and steam have hitherto been employed in common with all other kinds of similar erections, but since the introduction of the hot-water system, there are but few who will not avail themselves of it.

In whatever way the conservatory be heated, it is of much importance that it be done in such a manner as to have the means concealed, as neither smoke-flues, steam, nor hot-water pipes, however well they be executed, are pleasing objects in such a structure; and were they less so in point of deformity, must necessarily occupy a space which would be much better employed in giving greater breadth to the borders or foot-paths. The position most generally adopted for the flues or pipes, are under the foot-paths, and the heat is allowed to enter the house through brass ventilators fixed into the pavement, although in some cases this precaution is not attended to, but the heat is allowed to find its way into the house through the pavement; a great loss of fuel must attend this latter method, and a considerable difficulty occur in heating the house quickly, which is often desirable, in order to repel sudden attacks of frost. To remedy, in a very important degree, this waste of fuel, and to facilitate the more rapid admission of heat, cast-iron grating should be used, if not for the whole surface of the foot-path, at least for so much of it as covers the flues or pipes. The expense can be no objection, for in many cases the grating is cheaper than the pavement, and it may be cast to any pattern, and sufficiently close to render it comfortable to walk on. This grating should be kept regularly painted a stone color, both to add to its neatness and durability; or, for greater elegance, the upper surface may be covered with brass, which, with a little attention to cleaning, will add much to its neat appearance. As it is cast into convenient pieces, they should be so laid down as to

enable the cultivator to have them taken up when any repair or cleaning is necessary in the flues, or for any examination of the steam or hot-water pipes.

For the greater convenience of watering, it will be proper to have a capacious and water-tight tank sunk under the border, or other convenient part of the house, into which all the water that collects upon the roof, or upon any portion of the adjoining roofs, may be conveyed, and taken up as wanted by a neat pump, which may be either placed in a niche in the back wall, or so constructed as to take off by the surface of the floor when not in use.

FORMING THE BORDERS.

Opinions are at variance on the depth that conservatory borders should be made, and it may be generally inferred that they are made too deep to answer any good purpose. However, as houses of this description are erected and planted for different purposes, the depth of the borders should be governed by the design in view.

For houses of the most capacious dimensions, and in which plants are to be allowed to attain their greatest height and size, borders of three feet of mould, independently of draining, will be amply sufficient; and for houses of ordinary sizes, when fine specimens of flowering plants are the object, borders of two feet, or two feet and a half will be quite sufficient, as the plants will flower better when not too luxuriant. For houses where a constant succession of flowering plants is required, and which would be difficult to attain without all, or at least a great portion of the plants being portable, and brought to perfection in an auxiliary house, and only admitted into the conservatory when coming into flower, and removed when they become sickly or past flowering; in such houses the borders need not be deeper than sufficient in which to plunge the pots or tubs in which they grow, so as to give the whole the appearance of being planted out. Little on this system has been done in this country, in what may be called the changeable conservatory, but it is evident that much might be done with good effect.

It is a very general complaint, that many conservatory plants become too large, and while they deprive their more delicate neighbours of all kinds of nourishment, they become themselves too luxuriant, and seldom are sufficiently prolific in bloom to merit the space which they occupy.

This is the case with the less valuable or more common kinds; to obviate which, it will be proper to have the roots of all that are of rapid growth confined within the limits of a pot or tub, and those which are of slow growth only planted out. The confinement of their roots would answer two good purposes; namely, keeping them within proper bounds, and inducing a greater disposition to produce flowers. Thus most of the strong growing *Acacias*, *Eucalyptus*, *Metrosideros*, &c., would be kept within due bounds, while the less rapid growing *Melaleuca*, *Banksia*, *Dryandria*, *Daviesia*, *Pultenæa*, *Polygala*, &c., if planted out, would keep pace with them, and not be liable to be overrun. In offering this proposition, we are aware that some will object to it, on the very just principle, that many valuable plants, without which a first-rate conservatory cannot be considered as complete, do not prosper when plunged in the borders, as the roots are liable to become saturated with excess of moisture, a constant evaporation from the sides of the pots being prevented from going on, and also that it is difficult to ascertain what particular plants require water and what do not. To these objections we answer, that the plants so treated are not intended to remain long at one time in such a state, but to be withdrawn occasionally, to make room for others that are coming into flower; or when they themselves are past flowering, or appear to require being again placed on the shelves of the green-house or auxiliary-house; and as to the difficulty of watering, it is but one of the very many that the cultivator has to encounter, and one that none but a very superficial gardener will reckon insurmountable.

In whatever way the borders are arranged, as far as regards the depth of soil, it is necessary that they be rendered dry at bottom, according to the directions already given for this purpose, supposing that proper drains have been made to conduct any water that might accumulate under the border to a suf-

ficient distance from the house ; the whole surface of the bottom of the intended borders should be laid, to the depth of fifteen or eighteen inches, with brick-bats, flints, or broken fragments of stone, and, in placing them, they should be laid as hollow as possible, and level upon the surface.

Over this stratum of drainage should be placed one foot of turf cut from a heath or pasture, the soil being light and sandy, or if of what is called heath-mould, so much the better ; this turf should be cut to the thickness of four or five inches each, and when used, placed with the green side undermost regularly over the stratum of drainage. Upon this should be placed the mould of which the borders are to be formed, to the height of six or eight inches more than what is intended for the ultimate height of the border, to allow for its sinking or settling.

COMPOST FOR THE BORDERS.

It would be inconvenient and almost useless to attempt the formation of various soils or composts for the different plants which are cultivated in these structures. It is true that some few species, which it might be desirable to introduce into the conservatory, require soils peculiar almost to themselves, and in such cases it will be more convenient to retain such in large pots or tubs, which may be plunged into the general border, than to attempt forming distinct portions for themselves. Almost all plants, which are cultivated in such structures, are found to thrive well in a soil rather poor than rich, the object in view being more the attainment of plants of ordinary bulk and flowering habits, than the attainment of specimens of their natural size, for which we have no houses in this country capable of holding, neither (it is presumed) would it be advisable to make any such attempt. The majority of conservatory plants are found to prosper well in a soil composed of half peat-earth and light virgin-loam, with a small portion of pure white sand, the latter ingredient to be added in proportion to its absence in the former, or in proportion to the richness or stiffness of the latter. No previous preparation is at all necessary if these materials be good, neither should either be

sifted, as has been hitherto too much practised; if they be broken with the spade in the process of mixing, it will be sufficient; but this latter process should only be performed while the whole is perfectly dry. Rich strong soils, as well as manure, should invariably be dispensed with, the former being unfit for the roots of most exotic plants to run freely in, and the latter encouraging a degree of luxuriance not to be desired.

PLANTING.

In planting a conservatory, it must be admitted that picturesque effect would be desirable, but from the necessarily limited space and value of the plants, this can seldom be effected, except to a very limited extent. Cultivators, therefore, for the most part, content themselves by planting in such a manner as to give the plants such a situation in the house, which is calculated to the size that each is likely to attain. With this view, the loftiest are placed next the back of such houses as are to be viewed only from the front path, and those which have a walk round them have the tallest plants in the middle of the bed; while in others, which have two beds with a passage between them, as in our plate, the more robust are placed in the bed nearest the back, and those which are the most rare, valuable, or of more humble growth, occupy the front border. This style of planting is too often carried to the extreme, and when the house is finished, the whole presents a formal and stiff outline, appearing as if the plants were shorn into a regular slope, without a single twig to break the sameness of the surface. To remedy this defect, certain plants should be chosen wherewith to form prominent objects, whose fine or curious foliage, or general character, will break the straight outline, and give a more natural as well as pleasing character to the whole.

Many beautiful exotics are indigenous to thickets and shady situations, and others will thrive under the partial shade of other plants, some of which should be made choice of to plant as underwood, if it may be so called, which will not only hide the naked stems of the loftier growing species, but also

give a denser and more natural appearance to the whole ; and, in addition, exotic herbaceous plants, ferns, and bulbs, may be planted, which, with the occasional addition of a little moss, will hide one of the greatest deformities in our conservatories as they are at present planted, namely, the naked borders, which, in however good condition they may be kept, have always an unnatural appearance. A few plants of *Lycopodium denticulatum* will soon run over a considerably-sized border, and may, with very little trouble, be kept healthy and green. Other species, natives of our own woods, will prosper equally well ; of these, the beautiful *Hypnum Proliferum* and *Splendens* may be named, intermixed with *Cenomyce rangiferina*, *C. pyxidata*, *C. coccifera*, &c. It has been advanced by some cultivators, that covering the surface in this way is injurious to the other plants, but this opinion appears to have been offered without a practical knowledge of the contrary ; and as it is in imitation of nature, we cannot see how any reasonable objection to it can be maintained. We have had plants of the most choice, expensive, and delicate descriptions so treated, and never found any of them to be injured in the slightest degree. Some difficulty indeed presents itself for the proper selection of conservatory plants, and to obviate which, we will give in our *Systematic Catalogue* a list of plants suitable for this purpose, which may be considered sufficiently copious for general purposes. Those who plant with a view only of novelty, may be considered sufficiently acquainted with the subject as not to require any direction from a work professedly practical. It may not, however, be unacceptable to the planter of more humble attainments, if we here offer a few remarks on the sort of selection proper for conservatories in general. The two great general divisions of plants at present cultivated in these structures, are denominated, though vaguely, Cape and Botany-Bay plants, although many natives of other countries, particularly those of China and Japan are also admitted, and amongst them some of the greatest beauty and splendor. Cape plants in general are less robust in character, although equal to the others in the splendor of their blossoms : of these, a few very numerous but at the

same time exceedingly beautiful genera, may be said to be with propriety excluded from the borders of the conservatory; these are the families of *Erica*, *Protea*, *Geranium*, including the whole natural order of *Geraniaceæ*, *Gnaphalium*, *Elichrysum*, *Mesembryanthemum*, and some others, which are found to prosper much better in pots placed on shelves, or in situations very much exposed to a free circulation of air and abundance of sun-shine. They become, however, exceedingly valuable for decorating the front parts of conservatories while in flower, and to be afterwards removed to the green-house, which may be said to be their proper habitation. Of what are generally denominated Botany-Bay plants, and which include those of New Zealand, &c., fewer exceptions are to be found. True it is, that some cultivators have laid it down as a rule, that no plants from those countries, belonging to the natural order *Proteaceæ*, will succeed if planted out in conservatory borders; this is, however, now found to be erroneous, as many beautiful specimens are now to be seen, of this description, which prosper exceedingly well.

A conservatory completely furnished with New-Holland plants, may be considered very complete, and probably, with the addition of *Camellias*, and two or three other Chinese or Japanese plants, with the magnificent *Rhododendron arborea*, from the Nepaul Mountains, may be considered the acme of perfection. The splendid collections of Mr. Mackay at Upper Clapton, of Mr. Colvil and Mr. Knight of the King's-Road, will present ample opportunities for forming a collection of these plants, unequalled in Europe

In turning out plants from pots into the borders, care should be taken that the state of their roots and ball be examined, for unless attention be paid to this circumstance, many of them will to a certainty fail. Where the balls are hard, and the roots much matted, they should be broken, and the roots singled out considerably; for if that be not done, they will, in many cases, send out no roots into the border, and consequently, in watering, the water will pass through the light mould in the border, while the roots remaining in the old hard ball will not derive a sufficient degree of moisture;

and this evil will be daily increasing, till the ball becomes so dry that it will not even take in sufficient water for their support should even a superfluity be given to them. This occurs very frequently, and is not often detected until the plants show evident symptoms of dying, and may be considered the cause of the failures in nine-tenths of the plants planted out where this precaution is not attended to. Few plants better illustrate this circumstance than that of the beautiful family of *Camellia*, which make very small roots in proportion to the size of their leaves and branches, and for want of this precaution may be attributed the stunted and sickly appearance which these plants very often are found to assume when planted out; although, if attended to in this particular, few plants thrive better or continue longer to maintain their places in houses of this description. Watering at the root should be very punctually attended to after planting, until the whole borders have attained a proper degree of moisture, and until all the plants in the house have extended their roots beyond the limits of their former pasture. Afterwards it seldom occurs, excepting where the flues come in contact with the borders, that they become too dry. When the planting is finished, liberal supplies of water should be given them, not only at their roots but also over their branches, for a considerable time, particularly if the operation were performed in spring; and the borders should be carefully examined to their very bottoms frequently, to ascertain how they stand affected in regard to a proper degree of moisture. In planting, in the first instance, it will be necessary to introduce many plants to produce any degree of immediate effect, which may be from time to time removed as they encroach on those intended to be permanent, or as the latter increase in size, which, under favorable circumstances, will be the case in a few months after planting. As it may not be desirable that they should be sacrificed, and as few of them can be removed after being once established, without either sustaining injury themselves or injuring those around them, we would suggest the propriety of having all that is intended to be so removed, in large pots, which will enable the cultivator to remove them at pleasure, without much trouble or injury to those that remain.

Creepers add much to the splendor of a fine conservatory, as from the rapid growth of most of them, and the profusion of their bloom, they become highly useful in hiding disagreeable parts of the building, as well as in supplying a richness of flower and foliage towards the roof of the house, which other plants cannot be admitted to attain. In their after management much may be done by a tasteful mode of training them, so as to form festoons from pillar to pillar, or to hang in a seemingly careless confusion throughout the house. The situations where they are with propriety planted, are at the bottoms of the pillars that support many roofs of this kind of structure, or the bottoms of pilasters in the front of others, as in our plate, as well as the whole of the back wall, or other opaque parts of the house.

As to the season of planting conservatories, any period of the year may be chosen, but from February to September may be considered the most favorable.

ON THE CONSTRUCTION OF THE GREEN-HOUSE.

The green-house in general use differs little, if any, in form from that of houses for the cultivation of fruits, and considered merely as such, will answer every purpose of cultivation. However, when placed singly in the pleasure ground, or flower garden, more fanciful forms may be indulged in without any material injury to the plants.

Where circumstances will admit, it is certainly the most advisable plan to have all, or at least three sides of the house glazed, as affording more light and less shade to the plants. This cannot always, however, be the case; and when such a circumstance occurs, not more than one side, if possible, should be opaque. The late Mr. Nicol entertained more correct ideas of this sort of building than any author on gardening who preceded him, and probably nothing better can be offered on this subject than the following extract from his works:—"A complete green-house, being quite detached from other buildings," he observes, "should be glazed on all sides. In regard to form, it may be a circular, oval, hexagonal,

octagonal, or with two straight sides, and circular ends, which I think the best form of any; the next best, an octagon, whose sides are not equal, but with two opposite longer sides and six shorter sides; three and three opposite forming, as one might say, an angular oval, the ends being angular instead of round. In either of these last-mentioned forms, the stages and plants may be more tastefully arranged than in any other. Granting either of these cases, the house should be about thirty-six or forty feet long, eighteen or twenty feet wide, and ten or, at most, twelve feet high above a given level line for its floor. The parapet all round to be a foot or fifteen inches high, and the upright glasses placed on it four or five and a half feet a most. For," as he justly observes, "it is of importance for the sake of the finer kinds of plants, and in order to have all kinds grow bushy, and flower while young and small (in which state they are certainly most attractive and pleasing) to keep the roof-glasses as low as possible, just allowing sufficient head-room to the tallest person when walking in the passage." In regard to the concealment of the furnace and stock-hole, which ought to be kept from view, he further remarks:—"The furnace and stock-hole may be placed at either end or at either side, as may be most convenient, and they should be sunk under ground and be concealed. The flue to be constructed to run parallel to, and to be separated from, the parapet by a three-inch cavity, its surface being level with the top of the parapet, and being crib-trellised for heaths, Botany-Bay, and other rare plants. A walk, thirty or thirty-six inches broad, to be conducted all round next to the flue, within which to be placed the stages for the more common and the taller plants, being raised in the middle and falling to either side and end; corresponding with the glasses, though of course not so steep. A row of columns should be placed in the centre, in order to support the ridge of the roof, to which climbing-plants may be trained in various forms, and might be hung in festoons from column to column at top, or otherwise, as may be dictated by fancy. The front of the stage all round should be raised about eighteen or twenty inches above the walk, in order to raise the whole of the plants placed

on it sufficiently near the glass, thus forming the walk into a deep alley; the person walking in it having a narrow border of the finer and smaller plants on the one hand, and a bank of the more common and larger kinds on the other; than which, when the plants are healthy and thriving, few scenes can be more pleasing."

The same author further observes: "If a green-house must necessarily be attached to a wall, or other building, it might be constructed very much as above; with this difference, having one of the ends, as it were, cut off, in which case it should be placed with its circular end south, or towards that point, and the sides pointing east and west." This he considers "as the second-best constructed green-house, and in which, excepting in the above-described house, the plants would enjoy the fullest share of sun and light."

Many very complete green-houses are to be met with, the construction of which differs little from that of hot-houses in general, and notwithstanding all that has been said against their appearance, we find plants cultivated in them equal to those in houses of more fantastic forms. Of this description of house, many good examples may be seen even amongst the nursery-gardens round London. That of the large house for New-Holland plants in the Clapton nursery, and several in the nursery of Mr. Colvil, whose houses, taken as a whole, with slight modifications, would not disgrace the grounds of the most princely place in the kingdom, may be given as examples.

The **HEATH-HOUSE**, or **HEATHERY**, is a plant structure, solely dedicated to the cultivation of the beautiful family *Erica*. It requires to be as transparent as possible, situated so as to derive the greatest degree of sun-shine, and rendered capable of being thoroughly ventilated at all favorable seasons. Examples of this kind of structure are to be met with at Bothwell Castle, Woburn Abbey, &c.; at both places fine collections are kept up, although the house at the last-noticed place is badly constructed; and, amongst plant cultivators, that of Mr. Mackay's, at Clapton, may be considered as very complete. The leading features in the construction of this kind of house are, the

nearer the plants are placed to the glass the better, and placing them upon stone shelves instead of wood we consider to be an improvement, for the purpose of rendering the temperature at the roots more cool, or at least more uniform.

The ORANGE-HOUSE may be considered "the green-house of the last century," that is, a house with upright front sashes of glass, the roof being wholly or partially opaque. In such houses, oranges are found to thrive under good management; and, however defective, are far superior to the orangeries on the continent, where the finest specimens of this tree are to be found. Although oranges prosper well in houses very much shaded, or in such as have much less light than those destined for other exotics, still they will thrive better in those that are more transparent, or in such as are capable of being partially shaded at certain seasons; we would therefore propose, for houses glazed on all sides excepting the north, should they front the south, that they be furnished with creepers of the most rapid growth, planted so as to be trained up the rafters, and, in the general management, we would recommend, that, during the hot months of summer, the whole roof be covered with them, to afford a degree of shade of which the orange, in common with some other plants, are found to thrive under. During the spring and autumn months, the sun-heat would only be but moderated; as in the former case, the creepers would not have made much progress, and in the latter they could be cut away as the sun falls lower in the horizon. During winter they can sustain no injury from sun-heat in these northern latitudes, and during that period, the creepers could be cut in, and trained so as not to cast more shade than the rafters would do without them. In offering this mode of culture, we are perfectly aware that many will disapprove of it; however, we have the test of experience to sanction us, and if all the other parts of their management be only approaching mediocrity, there is little doubt but that fine healthy orange-trees may be produced; a circumstance much desired but seldom met with in this country. It is a singular circumstance, that the London nurserymen, who excel all other cultivators in the management of plants, should either pay so little attention to the culture of this family, or be so deficient

in success. Few oranges that we recollect to have seen in the vicinity of London, are well grown, and, with the exception of some very fine ones in the collection of Mr. Knight, King's Road, Chelsea, we do not know of twenty of large size fit for sale, that have been for any length of time in the country. Few plants, when good, are so much in demand, and few produce a higher price.

Oranges thrive best when not often removed, therefore the practice of introducing them into mansions in times of fêtes, or for decorating halls, &c., is to be reprobated; few trees, used for such purposes, continue long to prosper. Even the removal of them out into the open air in summer, as is generally the case with green-house plants, is not favorable to them, unless the situation be both shaded and completely sheltered: the foliage of this family is easily injured by the cutting breezes to which this climate is so much exposed. Most of the finest trees of this kind in the country have not been removed out of the house for many years, and most of those which are annually taken out seldom present any other appearance than that of mere skeletons, having little young wood and fewer leaves.

CAMELLIA-HOUSE. This very popular genus has certainly the most imposing effect when cultivated in a house entirely devoted to themselves, either grown in pots or large boxes, and placed on stages, as in green-house arrangements, or planted out in borders properly prepared for them in the conservatory manner. Indeed there are three genera of plants, *Camellias*, *Ericas*, and *Oranges*, which always succeed best when so cultivated; and as each genus has many species and varieties, a considerable degree of interest is to be expected from such houses during the greatest part of the year. In the construction of a Camellia-house, we may observe, that if the intention be to cultivate young or small plants, the same kind of house will be very suitable as that recommended for a green-house; and if planted out permanently in borders, that of the conservatory already described, or one nearly approaching to it, will be very complete. This interesting genus, like that of oranges, does not require so abundant a share of sunshine and light as some others, (the genus *Erica*, and most

Cape plants, for example,) at least, they are found to succeed perfectly well with a much less share of it. Houses, therefore, having much less glass in their construction, which is the most expensive material used in their erection, may be used with much propriety; and when the situation will not admit of a southern exposure, that of an eastern or western aspect may be freely indulged in. In erecting a house expressly for the purpose of cultivating Camellias, it is advisable to have it rather lofty, as the plants are seen to the greatest advantage when from six to eight feet in height, or even higher, particularly when well furnished with branches from the pot or tub upwards. While the plants are young or small, they may be elevated sufficiently upon stages so as to be sufficiently near the glass, and as they become enlarged, the stage may be gradually lowered, until ultimately they are of sufficient size to be placed on the floor altogether.

Houses for Camellias should either be so constructed at first as to exclude a certain portion of sun-shine, by being placed with their fronts towards the east or west, and in some peculiar situations even to the north, as these plants delight in shade, and retain their beautiful blossoms three times as long, when so situated, as when they are fully exposed to its influence. Shading such houses as are fully exposed during certain seasons corrects this defect, but, let it be remembered, that shading is attended with no inconsiderable expense, and has always a bad effect in garden scenery. Camellias in general flower early in the season, often in March and April; under such circumstances they perfect their flowers tolerably well, and retain them for a considerable period, in houses facing the south; but, to grow this tribe of plants in the first degree of excellence, some or other of them will flower at least ten months in the year. Those produced during the dark months of winter are in general the best, and always last the longest. Those that flower during the hot months of summer seldom perfect their flowers, and never retain them for any length of time, probably not two days. This is also the case when fire-heat is used while they are expanding their blossoms, and particularly so when fire-heat and want of sufficient ventilation are combined. Fire-heat is seldom neces-

sary to protect this plant if in a properly-constructed house, and we would say never, excepting to repel the most severe frost in winter, as it is almost sufficiently hardy to stand uninjured our general winters, when planted in any sheltered situation. However, in their culture in houses entirely appropriated for them, a deviation from this rule is necessary, when the object is to cultivate them in the first degree of excellence. When they are about to form their flower-buds, a gentle and moist heat is required, and which may be with advantage continued until their buds be completely formed, and nearly ready to expand; at which period, they should be either removed to a colder house, or, if the whole be equally advanced, the temperature of the house in which they are should be reduced to that of its natural state.

GREEN-HOUSE AQUARIUM.

The aquarium is a house furnished with suitable conveniences for the cultivation of aquatic plants; but the greater portion of them are either hardy, and consequently cultivated in the open air, or, being natives of tropical climates, are tender, and cultivated in the hot-house aquarium. Some few, however, very interesting species are from temperate climates, and are well calculated for the general temperature of the green-house. A small house for their reception is sometimes to be met with, the arrangements of which need not be different from those of the hot-house aquarium, (for which, see *Supplement*;) and the general culture being the same, the difference of temperature being understood, any further notice of it here might be deemed superfluous.

MONTHLY OPERATIONS

OF THE

GREEN-HOUSE AND CONSERVATORY.

JANUARY.

As the general treatment of the plants, in both the departments of the green-house and conservatory, during the greatest part of the year is so nearly alike, we will, for brevity's sake, consider them under the same head; but will, from time to time, as circumstances may require the notice of any particular trait in the culture of either, distinguish it separately in the course of the following monthly directions:—

TEMPERATURE.

As the majority of the plants cultivated in the green-house or conservatory are natives of temperate climates, and indeed many of them are found to withstand a few degrees of frost without any apparently bad effect, the less fire-heat that is applied to them the better. Indeed, a far greater number of plants are annually killed or much injured by too free an application of that element, than by the total deprivation of it. The mere exclusion of frost is perfectly sufficient for the majority of them; and when this can be effected without the application of fire-heat, the plants will always enjoy the best health. There are, however, some plants which cannot be well dispensed with in ordinary collections, which are less capable of withstanding the cold, and these should, if circumstances will admit of it, be placed together at one end of the green-house, where they may be more conveniently protected,

either by occasionally covering the glass nearest to them, or by being placed near those parts where the heat enters into the house from the furnaces behind, and which may be considered the warmest parts of the house. Succulent, or very tender plants, should not be allowed to stand so as to touch the glass, but be removed some inches from it. Nevertheless, they must, upon no consideration, be placed at too remote a distance from the light; for, during the months of November and December, the present, and the following month, all the light and sun-shine that they can enjoy in the most favorable parts of the house will be little enough for them, as the sun with us during these months is low in the horizon. Soft spongy rapid growing plants are more liable to be injured by frost than such as are less luxuriant and full of sap. Thus, a frost sufficient to kill the most common *Pelargonium*, or *Geranium*, will not in the least affect the most delicate *Erica*, *Banksia*, &c. The majority of plants, in almost every country, have their seasons of summer, of winter, of spring, and autumn, and however short the duration of such seasons may be naturally to them, with us they coincide nearly in the length of each, as far as relates to the latitudes in which we live. It is, therefore, improper to keep up a high temperature for such plants during the short days of winter, when the plants are, as it were, reposing for a short time, to enable them to shoot with greater vigour at a proper season. Endeavours to counteract this natural disposition in plants for the most part are attended with the most injurious consequences, and instead of benefiting the plants, only induce them to send up weak shoots and a few leaves, and consequently rendering them unfit to produce either a fine or abundant bloom. As a criterion, we may observe, that few good cultivators allow a greater range to the thermometer during winter than that of ten degrees, that is, from 35 to 45, excepting by the influence of sun-heat, and even that should not be allowed to exceed fifty-five degrees of Fahrenheit's scale.

WATERING.

Little of this element is necessary for plants in a state of inaction, and, like an excess of fire-heat, more plants are

killed at this season by too much of it than by the want of it. Some plants require none for many weeks at this season, and, as examples, those denominated succulent, with few exceptions, may be given; most of them will exist without any water from November till March, and even a much longer period. Bulbous-rooted plants require, during their inactive state, to be kept dry, as well as many others, which can alone be determined by the good sense of the cultivator.

The mould on the surface of the pots should not be allowed to become at all damp; and if they rather appear to be moderately dry, till their season of growing again return, they will be much better than if kept even so damp, as at other seasons they would require to be. As all plants take up and digest a portion sufficient for their sustenance of the food which is supplied them by the hand of the cultivator, whether it consists of liquids or solids, and no more; it therefore clearly appears, that supplying them during their inactive state with any stimulus, of which to them water is the chief, must be both erroneous and injurious. However detrimental a too liberal supply of water may be to plants at this season, it does not follow but that some exceptions are to be made, but this, like many other circumstances in horticulture, can only be obtained by observation and practice; as a rule, however, we may say, that all robust plants, and such as are old, will require more than those that are delicate and young. Coriaceous, or leathery-leaved plants, digest this element more rapidly than such as have a delicate foliage; of these, *Pittisporum*, *Camellia*, and some others, may serve for examples. In watering all plants at this season, care should be taken to spill very little on the floors or borders of the houses, and as small a quantity on the foliage as possible, as it only tends to generate damp; a circumstance to be carefully avoided, and which, if not guarded against, will be attended with the worst of consequences. There are, however, also exceptions to this rule, and these may be given as applying to plants kept in rooms, and all such as are kept in green-houses and conservatories in London, and other large cities, where, from the density of the atmosphere, and its being almost always charged with noxious gases, accompanied with smoke and soot, forms on the surface

of the leaves a coating of matter which in a short time stops the pores of respiration, and, in consequence, the plants soon die. To obviate this in a very great degree, repeated syringing over the leaves, and sponging those that are large enough to admit of the operation, will very much tend to remedy this defect. Not that such a mode of culture will enable the citizen to display so rich a profusion of plants permanently in his green-house or conservatory as the cultivator who lives at a greater distance from such an atmosphere; but we have no hesitation to say, that such a treatment will enable him to prolong the period of their existence for a considerable length of time; and, with regard to some plants, they may be cultivated with tolerable success as long as they remain fashionable, "for fashion dictates even in the choice of plants."

It may be necessary to observe, that such syringing or washing of plants ought to be performed in the early part of fine days, and as soon as the operation is performed the house should be ventilated to the fullest extent, to admit of the superabundant moisture being dispelled; and when the state of the weather is such as to render this mode of drying the atmosphere of the house impracticable, then recourse must be had to fire-heat, but which should be very sparingly applied, and sufficient ventilation given to admit of the moisture passing off in vapour. The force also of the engine, in applying the water, will supply, to a certain extent, the want of wind in such structures, and which, according to the experiments of Knight and others, appears indispensable to the majority of plants. It may appear almost unnecessary to mention, that rain or river water is always to be preferred to that from wells, at least until the latter has been exposed for some time to the action of the atmosphere. But, in this respect, London, as well as most other cities, are abundantly provided with water; and cultivators, in all situations, can command that portion which falls upon the area occupied with their house, and which should be treasured up, if soft water be scarce, or not to be had.

VENTILATING.

The admission of fresh air is an indispensable part of good culture, for, without it, the plants would soon be drawn up and naked, and many of them lose their leaves, and even die, while the more hardy would become weak, and naked at their bottoms, and devoid of colour. Where plants stand crowded upon stages, a circumstance not easily avoided when the cultivator is ambitious of the number or richness of his collection, or when, from a similar cause, they are planted too crowded in the borders of conservatories, air in such cases should be particularly attended to. In this respect, those houses which are capable of being partially removed, become of the greatest use; but all houses for the cultivation of these plants should, in their first erection, be made capable of being completely ventilated, so that three parts of the year the plants may enjoy nearly as much fresh air as if they were planted out. During this month, care must be taken that this element be as abundantly supplied as possible, for which purpose, the ventilators should be opened both at the back and front; and, in mild days, some of the sashes should also be partially opened for a few hours. However, in times of cutting frosty winds, a sufficiency of air will find its way into the most completely finished houses through the spaces between the laps of the glass, and at other crevices, to render the opening of the ventilators unnecessary. Air may be safely admitted at this season to keep the thermometer as low as 40° during the time of its admission. It may be here also remarked, that it is not altogether in the size of the spaces opened, nor the length of time that they remain open, that changes the air most completely in any structure. The difference of its specific gravity should be taken into consideration, and as that which is colder is considerably heavier than that which is hotter, and as it has been sufficiently demonstrated that the lightest or warmest air accumulates at the top of the house, it therefore follows, that when the top ventilators or the top part of the roof is opened only, the heated air will ascend by the force of its own gravity, unassisted by any other impetus; whereas, if the bottom ventilators or lower part of the house be opened only a small

space, the current of cold air flowing in displaces that which is lighter and hotter towards the middle and top of the house, and drives it out by its gravity, added to that of the former impetus. It is, therefore, more in the just regulation of the ventilators, than in the space or length of time they are left open, that the most complete change of air can take place.

GENERAL MANAGEMENT OF THE GREEN-HOUSE AND CONSERVATORY.

During this season, the plants in both these departments will require to be often looked over, and all dead leaves removed; dampness, where it appears, should be removed and counteracted by all possible means. The surface of the mould in the pots, as well as that of the border of the conservatory, should be frequently stirred up, and such plants or branches as require support, should be tied up in a neat manner, and all dead or decaying branches removed. Cleanliness should be attended to; for, besides the disorderly and slovenly appearance which a want of it betrays in the cultivator, a strict attention to it will materially aid in maintaining a healthy state in the plants. Few plants will be in flower at this season, but such as are should be placed in the most conspicuous places, so as to make as much of them as possible. Where a display of flowering plants is required at this season, it may be obtained by having in an auxiliary pit, or house appropriated for that purpose, a succession of such plants, slightly forced or retarded. To the first class may be referred, bulbs potted in September or October, and roses, lilacs, azalias, and other hardy plants, which will bear forcing at this season. These, as they are coming into bloom, should be introduced both upon the stages of the green-house and into conspicuous parts of the conservatory, and will give a gaiety by their bloom at this cheerless season, when few of the plants cultivated in either the green-house or conservatory are in flower. To the second may be referred, the later flowering varieties of *Chrysanthemum Indicum*, which may be retarded so as to be still well in flower; and many varieties of that splendid genus, *Dahlia*, which have been grown in large pots, and removed into the

house on the appearance of frost, will be still, with a little management, in fine bloom. Indeed, the latter genus is often taken up out of the natural ground, while even in full flower, and potted; after which, they continue in a tolerably flowering state till towards the end of this month.

Mignonette sown in September in pots, and protected, will now be in fine perfection, and should be disposed of in sufficient quantity to produce a degree of fragrance which at this season will be very desirable. A little artifice is necessary during the last, the present, and the succeeding month, to give a gay appearance to these departments, as after that period, many of the plants in both will be coming naturally into bloom. It may perhaps be thought going rather too far to insinuate that even artificial flowers would have a good effect at this season, but if these be well executed, they may be used, if not with propriety, at least with effect. This we believe is rather a novel idea, and, as far as we know, the practice has not been carried to any extent in this country. We have been, in conjunction with a gentleman of first-rate talents for taste and judgment in these matters, engaged in a series of experiments of this kind, which were intended to have been exemplified in an undertaking, which unfortunately, from unforeseen events, has been rendered next to abortive. However, the experiments have been carried sufficiently far to convince us of the practicability of the scheme. Of the flowers best calculated for this device, we have found the whole genus of *Camellia*, with all its varieties, to succeed the best, and have found less difficulty in getting the flowers manufactured; indeed, so close was the imitation, that very skilful judges could not detect the substitute amongst the real flowers, at three or four feet distant. Substitutes of this kind may be used for climbing-plants, which are the greatest ornament of a conservatory when in good keeping; and as they are always a considerable distance from the eye, they are less liable to detection. Should this be deemed an innovation on the horticulturist's taste, as far as regards the decoration of his green-house or conservatory, (for particular occasions,) there can be no impropriety in adopting it to any extent in the decoration of saloons, halls, or rooms, in times of fêtes or

balls, which are well-known to be great destroyers of plants; and as these are, for the most part, seen by candle-light, the illusion will be the more complete. Thus groves of *Camellias*, covered with innumerable bloom, some fully expanded, others less so, of all the forms and colors that this splendid family sports into; and groupes of oranges, laden with artificial fruit, or natural fruit fastened on the trees, and bloom, would, of themselves, be pleasing objects, and give a character to these scenes not ever to be attained naturally, and which would be accomplishing a desideratum always wished for, but never perfectly attained. Indeed, it would be difficult to say how far this idea might be carried. The *haut ton* might be enabled readily to convert their drawing-rooms into a temporary conservatory, adorned with all the varied hues of Flora, and, by artificial means, diffuse a fragrance by very simple means, both exhilarating and delightful.

PLANTS IN PITS AND COLD FRAMES.

Where extensive collections are kept up, it will be found a very necessary appendage to have one or more pits or frames for the protection of plants which are sufficiently hardy to stand our winters without fire-heat. Indeed, many of the best cultivators amongst the London nurserymen, manage to keep a great portion of their stock in such places; amongst them may be mentioned Mr. Henderson, Pine Apple Place, Edgware Road, one of the best cultivators of plants round London; and Jenkins, of the Portman Nursery. The former keeps his heaths, *Ericas*, and many other Cape and New Holland plants, in common garden frames, covered with mats, during severe weather, and few persons succeed better in their cultivation.

In all private collections, pits or deep frames will be found exceedingly useful for the protection of *Ericas*, *Hydrangeá*, *Fuschia*, *Myrtus*, and many others. Their principal management, at this season, consists in carefully covering them at nights, and during frosty days, with mats, straw, or soft hay, to exclude the frost, and by ventilating them sufficiently in fine weather. The principal feature in their whole winter treatment consists in keeping them as dry as possible, and free

of damp; for which purpose they should be often examined during fine days, and all appearance of damp removed or counteracted. They should stand on, or be plunged in a dry bottom of coal-ashes, or loose pebbly gravel, and should be kept clean from mosses or weeds. Dead leaves should be carefully picked off them where they appear, and the plants often turned to the sun.

Pits built of bricks, having their walls twelve inches thick, and covered with glass, will protect many species of plants for the greater part of the year, with the assistance of a covering of mats in times of frost. During severe frosts the side walls may be covered by applying a quantity of littery dung, leaves, or similar matter, not, however, with a view to give any heat of themselves, but merely to prevent the penetration of frost through them. The glasses should also be covered with double or treble mats, or with soft hay, straw, or any more convenient substitute. The mere exclusion of frost being sufficient, every means likely to attain that end should be minutely attended to. In such pits should also be wintered those green-house plants which are intended to decorate the flower garden borders in summer. We flatter ourselves that if this method of protecting plants during winter were more generally adopted, we should then see more respectable collections in the gardens of this country; but it is with this, as with many other matters connected with horticulture, depending, in a very great degree, upon the taste and disposition of the gardener. Were collections of green-house plants divided into two or three divisions, according to their relative degrees of hardness, and each division wintered in a department suited for them; and if greater attention were paid to the cultivation of the hardier species already in the country, and means used for the introduction of new plants, or re-introduction of such as have been lost in the country, that require only protection from frost, our plant collections would not be so meagre and limited as they in general are. The green-house, properly so called, should be stocked with the more rare or tender species, and probably one or two specimens of such as are doubtful, to prevent their loss during severe winters. The plant pit should be filled with those that are a degree hardier, and the cold frame, or turf pit, with the

hardest of all, or such as are denominated frame plants. It is probable that plants would become, by degrees, under such treatment, hardier in each succeeding generation. There are some plants which now occupy a place in our shrubberies, which, within our own remembrance, were kept in the stove, the genus *Canna*, for example; and many which, within the same period, occupied a place in the green-house, are now treated as perfectly hardy, of these *Aucuba japonica*, *Pæonia montan*, *Corchorus japonica*, and many of the genus *Cistus* and *Magnolia*, may serve as examples. Most of the herbaceous green-house plants, and all bulbs usually kept there may be reckoned as amongst the most likely to stand our winters in such situations. It is to be regretted that so little attention is paid to these two last divisions of green-house plants, many of them possessing great merits when in flower; probably the want of foilage, or continued verdure during a certain period of the year, may be assigned as the cause of their scarcity in collections. Many Cape bulbs of great beauty may be cultivated with little trouble, and require no room in the green house during winter, as they are found to sustain no injury by being deposited in any dry room or loft, either in the pots, or taken out of them during the time of their inactivity. Many tuberous rooted plants may be kept in the same way.

PROPAGATING GREEN-HOUSE AND CONSERVATORY PLANTS.

As some of these produce no seeds in this country, at least many of the more valuable and scarce species, recourse is had to the various other modes of propagation, such as by cuttings, layers, grafting, budding, &c.; but of these, that of propagating by cuttings is most generally adopted, and more speedily accomplished. As all plants do not propagate by this method with equal success; some only by pieces of the old or ripened wood, others by the young shoots, while quite soft and young, different seasons, therefore, are chosen to suit the kind of plant, its state of growth, &c. For some species this month is preferred, particularly with such as remain long in the cutting-pots before they strike roots, as is the case with most hard wooded plants. By beginning thus early, the young plants become

well rooted in June, and when then potted off, are fully established in the pots to withstand the effects of the succeeding winter.

This operation should be proceeded in as the plants are found to be in a fit state, and when, as is often the case, that the plants from which the cuttings are to be taken are not advanced enough, a slight forcing may be adopted to forward them. This is often adopted with such plants as *Erica*, *Polygala*, *Indigofera*, *Crotolaria*, *Chironia*, and many others, which, if placed in the plant-stove, vinery, or peach-house for a few weeks, produce shoots very proper for this mode of propagation. It is, however, soon enough to put any of them into a state of excitement about the middle of this month; and, in that case, by the beginning or middle of next month, they will be in excellent order for the process. Those put in at this season, or even next month, for the most part strike root sooner, if not with greater certainty, if placed in a very moderate temperature; for which purpose, the pots in which they are planted should be set on a mild bottom heat, in a close frame, and closely covered with bell or hand-glasses, over which should be placed the frame and lights; the closer that they are kept, if damp be guarded against, the more complete will be the success.

This season has certain advantages superior to any other. The cultivator is more at leisure to attend to the minutiae of this part of his charge; and therefore it is more likely to be attended to with greater regularity than at a more advanced period of the year, when the whole machine of the operations of the garden may be said to be in full action. The sun is now less powerful, and consequently less shading is necessary; and a uniform degree of moisture can be longer maintained than at any other season without the application of water, which is no unimportant trait in this branch of culture. Independently of which, all the cuttings, taken just as they begin to shoot, have the advantage of those which are put in at a more advanced period of their growth, as they have not lost any of their excitability, and are consequently better calculated for exerting their whole strength in the production of roots.

FEBRUARY.

VENTILATION.

The instructions given upon the subject of ventilation last month are applicable to the present also; but as the season will be now advancing, and the sun gaining greater power, more liberal ventilation should be from time to time given; and, as some of the plants will now be beginning to *break* or bud into shoots, this is the more necessary, to give strength to these organs while yet in their young state, to enable them to produce perfectly formed shoots and buds, without which neither handsome nor healthy plants can be expected, and, consequently a meagerness of flowers.

TEMPERATURE.

Much of what was said the preceding month regarding temperature is applicable to the present one also; but, as the sun will be now more powerful during the day, less fire-heat will be wanted during the night; indeed, if slightly covering the lower parts of the house, or those parts where the plants are nearest to the glass with mats, will keep the frost out, it will be better to dispense with fire-heat as much as possible. While the frost is kept from appearing on the under side of the glass, the temperature in the house may be reckoned as sufficient for most of the plants within it. This was the criterion always adopted by the late venerable Mr. James Lee, of the Hammer-smith Nursery, a name so associated with plants, and so well known and remembered throughout Europe, as to stand in need of no praise from one of his numerous pupils, and may be considered as a safe and simple rule to go by.

WATERING.

As some of the plants of the earliest habits will now be beginning to spring, water may be given to them in rather larger

quantities, still however by no means too liberally; as, although this very necessary stimulus is indispensable to them at this period, a superabundance of it would be extremely injurious, and would not only, as it were, cloy them, but also keep their roots in a state unfavorable for affording the necessary food for the growth of the plant. Those that as yet show little or no signs of vegetation, should be, as recommended last month, kept rather dry, at all events till towards the end of this, or the beginning of next month.

GENERAL MANAGEMENT OF GREEN-HOUSE AND CONSERVATORY PLANTS.

These plants will require to be often looked over, and all decayed leaves and branches cut or picked off as they occur. The surface of the pots in the former, and that of the bed in the latter, will require to be often stirred up to prevent the growth of moss, as well as to prevent the generation of damp. Supporting the plants where they stand in need of it, and turning those which are portable in the latter, and all of those in the former, is an indispensable trait in their culture at this season; for, if left long in the same position, the sides which are the most shaded, or farthest from the light, will become naked and leafless, and ultimately render them very unsightly.

In the progress of this work we have frequently noticed the erroneous practice of what may be termed a general shifting or repotting of plants; nothing can be worse in practice, particularly in the cultivation of tender exotics. All plants do not begin to vegetate at the same time, nor do they all alike decompose the food supplied them at their roots. Some rapid growing species will exhaust the mould in the pots in a few weeks, while others that grow less luxuriantly will subsist for several years upon the same body of mould. These things being taken into consideration, the repotting should be regulated accordingly. Some plants will now be beginning to vegetate, and therefore they should be examined; and, if in need of larger pots, or even of fresh mould in the same sized pots, which is often necessary, as it is always desirable to have plants in as small pots as possible, they should be attended to at

this season. Green-house and conservatory plants, like all others confined within the limits of a close atmosphere naturally (even under the best management) become drawn, as it is technically termed, that is, naked of branches near their bottoms, and often become sickly and diseased; such, therefore, should be headed or cut down to a proper height, making choice to cut at such parts of the stem or stronger branches as are most likely to produce young shoots wherewith to form the future habit of the plant. Many plants, with a little management, may be remodelled, as it were, by this means, even after having become very unsightly; and, as far as regards conservatory plants permanently planted out, is the only method of keeping them in proper form. But, in regard to green-house plants, properly speaking, as they are seldom required to be of large size, a more eligible practice will be found in annually propagating and keeping up a young stock, so that when any of the plants become sickly, or are drawn up weak, or otherwise deformed, they should be thrown away to make room for young plants propagated the preceding season either from seeds, cuttings, or other means. Many families of plants are thus cultivated only for one season or two, and then thrown away; and by such management only a healthy and handsome green-house collection can be expected. When green-house plants are headed down, it is, in most cases, necessary at the same time to shift them also; and, at this early season, those so headed down should be placed in a moderate heat for a fortnight or three weeks to excite them to break stronger and more regularly into shoots. Care, however, must be taken that they be not placed in too high a temperature, for that would defeat the end in view. Conservatory plants require great attention, as far as regards pruning and training, and this is a very proper season for this operation. Pruning of such plants depends upon so many circumstances, that no fixed rules can be laid down; it may, however, be premised, that, as abundance of blossom is desirable, attention should be paid to produce a flowering disposition, as far as can be attained. The natural character or habit of such plants is also a desirable point to be attained in their management, and it is, therefore, one which the cultivator should study carefully. All dead or ill-placed shoots should be re-

moved, and when valuable or scarce plants become crowded by those less valuable or choice, the latter should be cut away by degrees to make room for them.

At this season also, conservatory climbers should be examined and pruned, so as to produce shoots in such situations as it may be desirable to have covered; a general regulation of them should also now take place; and where any have died, or are in a sickly state, their place should be supplied with young plants, for which abundant provision should be made by having, at all times, a sufficient stock of young ones for the purpose.

ORANGES.

The orange being a native of India and China, although successfully cultivated in the warmer parts of the South of Europe, requires with us the protection of glass, at least for three parts of the year; and some cultivators, as we have elsewhere remarked, keep them always under cover; and such is our view of the subject, that to have this tree both healthy and fruitful, it should remain always in that state. However, some cultivators manage to cultivate this tree, who adopt a different practice. In some parts of Devonshire it has been found to succeed in the open air, and trees are there pointed out that have withstood the winter for more than a century, and producing fruit as large and fine as any from Portugal. We may also here remark, as a proof of the doctrine first laid down (if we mistake not) by that valuable patron of horticulture, P. Neil, Esq. of Edinburgh, that plants originated from seeds ripened in the open air of this country, are most likely to produce a progeny of hardier habits, and of all are the most likely to become acclimated in this country. This is asserted to be the case with the orange trees in Devonshire; and we know from observation that it is the case with many other exotics. Professor Bradley, in describing the large orange trees, which once grew at Beddington, in Surrey, says, that they always bore fruit in great plenty and perfection; and that they grew on the outside of a wall, not nailed against it, but at full liberty to spread, and that they were fourteen feet high, twenty-nine in-

ches in circumference at the trunk or stem; and that they covered above one hundred square feet of wall. These trees, after having stood in the open air for a great many years, were killed at last by the severe frosts in 1739-40. As the cultivation of the orange, and its associates the lemon, citron, lime &c., is probably less understood generally than any other exotic fruit-bearing tree in our gardens, we will here deviate somewhat from the general plan of this work, and detail the practical observations of several of the most successful cultivators of this fine family, together with that of our own practice in this place, instead of dividing these observations in their monthly order.

Oranges, like most all other fruit-bearing plants, are propagated from seeds, which ripen perfectly with us, as well as from the seeds of imported fruit. Varieties are thus produced; but as it is seldom the object of the British cultivator to originate new or improved varieties of this tribe, the young plants so produced are most generally intended and used for stocks, on which to bud, inarch, or graft approved varieties, which have been already cultivated. The seeds may be sown at any period of the year when they may happen to be procured, or they may be kept for several months with little difference as to the ultimate success. From the beginning of February to the end of September, however, may be considered the most eligible season for this purpose. As it is a principal object to have strong stocks, a preference is generally given to the most robust growing kinds; and we find Miller, one of the earliest cultivators of this tribe, preferring those of the citron, and several more modern propagators agree with him in this point. We have, however, often taken seeds of any of the tribe that were the most readily met with, and our success has been complete. We have, however, preferred the seeds of imported fruit, and those of such as have become rotten in the warehouses; and if they be sown in rich light mould, about the end of March or beginning of April, and placed in a mild bottom heat, and kept rather moist and close, they will soon vegetate. The back of a melon or cucumber frame is a good situation for this purpose. When the seeds vegetate, they should have abundance of light, and the sun, at that early period, will not

be too powerful for them ; but for such as are originated at a more advanced period of the year, we have invariably shaded during the hottest hours of the day. When the plants are of sufficient size to pot off, which they will be in the course of three weeks after sowing, they are then potted into small sixties, one plant in each pot ; the mould used being rather richer and stronger than that into which the seeds were sown. When potted off, they should be placed in a close frame, with a genial bottom heat, the atmosphere of which may stand at from 55 to 60 degrees of Fahrenheit's thermometer during the night, and a few degrees of rise allowed during sun-shine. As the season advances, shading from the full sun should be attended to, and a moist genial steam kept up in the frame, which will be obtained while the bottom heat is sufficient, by watering the plants over head in the afternoon, and shutting up the frame closely. Air must be regularly admitted to prevent the plants from being drawn up too weak, particularly while the bottom heat is strong. Occasional applications of liquid manure should be given them once a week, but care must be taken in the application that none of it fall on the leaves of the plants.

With good success, in four months the plants will be from eighteen inches to two feet in height, and may be immediately operated upon by grafting, or shifted into larger pots, and kept in a moist mild heat till autumn, when they may be gradually hardened and placed in the green-house or orange-house till wanted for stocks. When strong stocks are, however, desired, and when trees with tall stems are the object in view, they may, early in the following spring, be placed in a moist bottom heat, and cultivated for another season, as already directed, taking care that the leading shoot be not injured, nor any superfluous side shoots allowed to remain on them. By the second July after sowing they will be in good condition for budding. When stocks are used the first season of their growth, we have succeeded by grafting them, when about the thickness of a quill, in the following manner :—Young shoots of a favorite variety are selected, being rather smaller than the stock, and about four or six inches in length. The stocks are prepared for them by taking a thin slice off one side (at about half their height,) just merely to remove a very small portion of the

wood; the graft is prepared in like manner, by merely taking off a thin slice of it; they are fitted together in the usual manner, and fastened with fresh matting, which is wound round the stock, from about an inch below the union, and carried up about an inch above it. No clay, but only a little fine moss, is used to envelope the part operated on, and kept constantly moist. The head or leading shoot of the stock is not now shortened, but left growing until some weeks after the union is ascertained to be complete; it is then headed down, as close to the part of union as convenient, but not too close, for fear of displacing the graft. The remaining piece of the stock is removed some months after the graft is established, and, if carefully done, the part of union will, in a few months longer, scarcely be visible. When the operation of grafting is just completed, the plants are placed under close hand-glasses, within a hot-bed frame with a good heat, and seldom removed until the union be complete, and that only to give a little water. By this process we have had many fine orange plants from two to three feet high, and often covered with bloom within two years, from the day of sowing the seed.

The late Cushing describes a somewhat similar method of grafting, in his *Exotic Gardener*. "Form the scion as for the common whip-graft, and then, without taking off the head of the stock, cut from the clearest part of its stem an equal splice as smoothly as possible; do not tongue the scion, but tie it on neatly and firmly with matting and clay, in the manner of a graft; plunge them in a hot-bed, and cover with a cap-glass till the scion begins to grow, and then cut away the top of the stock, and remove the matting by degrees." Nairn, in a communication to the Horticultural Society, details the following as his practice:—"Let the operator select as many orange or lemon stocks as he wishes to work, and place them on a moderate hot-bed for a fortnight, by which time the sap will have risen sufficiently to move the bark; the stocks must then be cut off, about two inches above the surface of the pot; and an incision made with a sharp knife, similar to what is done for budding, separating the bark from the wood on each side. Let the scion be cut thin, in a sloping direction, and thrust between the bark and wood, and then bound tight with woollen yarn; but

very great care must be taken in binding to prevent the bark from slipping round the stock, which, without attention, it is very apt to do. After it is properly and neatly bound, put a little loam or clay close round the stock, to the surface of the pot, then, with a glass of a proper form (a figure of which he gives) to prevent the damp from dripping on the scion, cover the whole, and press it firmly into the mould, to prevent the air or steam from getting to the plant; the glass must not be taken off, unless you find any of the leaves damping, and then only till this has been remedied, when it must be immediately returned. The stocks must next be placed on a brisk hot-bed of dung, and, in about six weeks, the glasses may be taken off, and the clay and binding removed; but it will be necessary to bind on a little damp moss in lieu of the clay, and to keep the glasses on in the heat of the day, taking them off at night, when, in about three weeks or a month, they will be fit to put into the green-house, where they will be found to be one of the greatest ornaments it can receive. I should recommend," he observes, "the Mandarin orange for the first trial, as the fruit is more firmly fixed than that of any of the other sorts," for, by this method, he has successfully performed the operation with not only the flowers, but also the fruit upon the scion, and has had no less than seven oranges on a plant, in a pot of the small sixty size.

That successful cultivator, Henderson, of Wood-Hall, details his method of grafting the orange tribe as follows:— "Take two-year-old wood, cut into lengths of about seven inches; if the stock be much thicker than the graft, cut a piece out of the stock of a triangular figure, about an inch and two-eighths in length, regulating the depth according to the thickness of the graft, and keeping it square at the bottom. Displace two leaves at the bottom of the graft, for the convenience of getting it put on; cut the graft right across under one eye where a leaf has been taken off; dress the graft to fit the receptacle made in the stock, observing to keep the lower end of the graft equal in thickness as above; always let three or four leaves remain untouched on the graft. After the graft is fitted in the stock, tie it up with bass matting, and put clay round it. If the grafts and stocks be nearly of the same

thickness, cut the stock at right angles, nearly half through. Cut off the piece, keeping it equal at top and bottom; cut the lower end of the graft right across under an eye, and with a knife prepare the graft to fit the stock. When the grafted plants are tied up and clayed, set them at the back of the vinery or peach-house, observing to keep them away from the flues, as fire-heat is hurtful to them at first; cover them with hand-glasses, or, if a frame can be spared, it is still better. Shade them every day, but take the mats off at night; continue the shading till they have begun to grow, when they may be exposed to the light. If any stock happens to be so tall and thick that it cannot be placed under a hand-glass or frame, put two or three grafts on it, set in any convenient place in the house, and shade it with mats: it will succeed perfectly in this way; the grafts lose none of the old leaves; and, in five or six months, they will make three or four young shoots, six or eight inches long; these, with the leaves that were on the grafts when put on, form a well-clothed little plant."

Orange-trees are also propagated by budding, either when the stocks are young, or when they are even of considerable size. Handsome plants may be formed by this method when young stocks are used, but this cannot be the case when the stocks have attained a large size; and hence arises a great defect in many of those that are annually imported into this country from France, and particularly from Italy, &c., where the stock operated on is often from one to three inches in diameter at top, and, in consequence, seldom forms a union so complete as to conceal the amputation of the stock. When this species of propagation is had recourse to upon small stocks, a deep frame will be found a suitable place, both that the plants may be conveniently shaded, and attended to till the bud be fairly established. From the time that the bud is inserted, until it be completely taken with the stock, air in a moderate quantity should be given; and if the operation be performed during the hot months of summer, the frame should be placed so as to have a northern exposure, or be partially shaded, but not under the drip of trees. The period that elapses from the time the bud is put on till the union takes

place, depends a good deal on the state both of the stock and bud, but four or five weeks, under ordinary circumstances, will be near the truth. Those which appear to have taken at the end of that time, should be gradually untied, and kept well supplied with air and water, and occasional shading, till the end of summer, when they should be taken into the orange-house or green-house for the winter. In the following spring the stocks should be headed down to about two inches above the bud, and placed, by the first week in March, into a mild bottom-heat, and kept in a humid atmosphere. Great care should always be taken in applying bottom-heat to this tribe of plants; for, although they will sometimes appear to stand a considerable degree of bottom-heat, still more injury is done by too much of it than too little. The summer after budding, they should be kept in a growing state; and, if ordinary success have attended the process, they will, by the beginning of August, be plants of a considerable size. From that time till the middle of October, they should be gradually exposed to more abundant air and sun-shine, to ripen or harden the young shoots of the season, to enable them to break strong the following year. When the cold evenings set in, they should be removed to the orange-house or green-house, where they are henceforth to remain.

Propagating oranges by cuttings, as far as we can ascertain, is comparatively a modern improvement in their culture, and has been proved most successful by several cultivators of late years, and we find it recommended by correspondents both in the Transactions of the London and Caledonian Horticultural Societies. In the latter, that very able cultivator, Henderson, of Wood-Hall, gives the following as his practice, and considers it by far the most expeditious method of procuring handsome plants:—
“Take the strongest young shoots, and also a quantity of the two-year-old shoots; these may be cut into lengths from nine to eighteen inches. Take the leaves off the lower part of each cutting to the extent of about five inches, allowing the leaves above that to remain untouched; then cut right across, under an eye, and make a small incision, in an angular direction, on the bottom of the cutting. When the cuttings are thus prepared, take a pot, and fill it with sand; size the cuttings,

so that the short ones may be altogether, and those that are taller, in a different pot. Then, with a small dibble, plant them about five inches deep in the sand, and give them a good watering over-head, to settle the sand about them. Let them stand a day or two in a shady place; and, if a frame be ready with bottom-heat, plunge the pots to the brim. Shade them well with a double mat, which may remain till they have struck root; when rooted, take the sand and cuttings out of the pot, and plant them into single pots in the proper compost. Plunge the pots with the young plants again into a frame, and shade them for four or five weeks, or till they have taken with the pots; when they may be gradually exposed to the light. From various experiments, I found," he says, "that pieces of the two-year-old wood struck quite as well; and in place, therefore, of putting in cuttings six or eight inches long, I have taken off cuttings from ten inches to two feet long, and struck them with equal success. Although I at first began," he observes, "to put in cuttings only in the month of August, I now put them in at any time of the year, except when the plants are making young wood. By giving them a gentle bottom-heat, and covering them with a hand-glass, they will generally strike roots in seven weeks or two months. The citron is most easily struck, and is the freest grower. I therefore frequently strike pieces eighteen inches long; and as soon as they are put into single pots, and taken with the pots, they are grafted with other sorts which grow freely."

In regard to the precise season of grafting, or putting in cuttings, this excellent cultivator observes he is not particular.

Hawkins, in Hort. Trans., describes a method of propagating this family by cuttings, the principal feature of which appears to be, his placing his cuttings so that their base or lower end may rest exactly upon potsherds, placed for the double purpose of draining and facilitating the production of roots. Other cultivators propagate sometimes by selecting the young succulent shoots as soon as they are done growing, which they plant in well-drained pots of light sandy loam, and which they cover with a bell-glass, and set in a gentle bottom-heat. The success of this method is ascertained in about two months, when the cuttings will either have struck root or rotted off.

Some prefer taking in spring the shoots of the previous year's growth, which they plant in pots, as above, and cover with glasses in like manner; but instead of putting them immediately in a bottom-heat, they prefer plunging them in a cold frame, where they remain three or four months in an apparently inactive state: at the end of that time, part of them will have formed that callous excrescence at their base which forms on most plants previous to the emission of roots, and such as have not this appearance at their base, have little chance of succeeding. During the following winter they are kept in a low temperature, and in the ensuing spring are placed in a moderate hot-bed, where they push freely, and become good plants.

Laying, as a mode of propagating oranges, has been tried, but not to any extent, so far as we know, in this country, although it be not unusual on the continent. This is the less to be regretted, as plants of any kind so produced seldom make fine trees; and as the other methods of propagation are so successfully and easily accomplished, we cannot recommend the adoption of a process so unlikely to answer the end in view. As inarching is a species of grafting, or what is called grafting by approach, this family may be successfully increased by that means, and although we have not observed it in practice, we think it very probable that orange-trees may be increased in size by inarching several pretty large plants on one stock, as is done to a certain extent in the cultivation of *Camellias*; at least the idea appears feasible enough to deserve a trial.

Orange-trees are sometimes propagated from seeds, not altogether with a view to obtain stocks, but also for the purpose of remaining in their natural state, and instances occur of their coming into a fruit-bearing state, while of a small size and of only a few years growth: this we learn from a communication in the Transactions of the Botanical and Horticultural Society of Durham, Northumberland, &c., to be practised by Mr. Gray, of Belsay Castle, who details his mode of culture as follows:—"I have at present," says he, "a seedling lemon-tree, with upwards of forty green fruit on it, likely to swell to a great size; those which are engrafted or budded, I observe, come sooner to a bearing state, but are

never so healthy trees as seedlings. I find I can bring a seedling orange-tree into bearing in six years. I have observed the young seedling-trees to put out thorns at the base of the leaf, and so long as these appear on the young wood, no fruit can be looked for, as the tree is in too luxuriant a state." To correct this luxuriant habit, he uses the following compost:—"Mix half strong brown loam, half peat or heath earth, well together, with a little gravel to keep the soil from binding to the roots; have pots proportionable to the size of the tree; put them into this soil, which he considers rather poor, but it keeps them in good health and in humble growth: by this management they come sooner into a bearing state. He keeps them in that soil till he sees blossom appearing, which may be looked for when no thorns push out of the young wood. After that he gives them larger pots; then takes compost, half strong brown loam, half vegetable mould; breaks some bones small, mixes some in the compost, and puts some in the bottom of the pots, in order to feed the roots a greater length of time, and drain off superabundant water." He proceeds to detail the following very rational mode of after culture, which is exactly corresponding with our own views of the case, particularly as regards heading down the trees:—"In pruning orange-trees, care must be taken not to shorten any young wood, as the flower generally appears at the extremity only, cutting out any cross useless wood." He very justly condemns the practice of annually heading down orange-trees, and observes, "by that treatment it is impossible for trees to bear fruit, for in spring they bring forth strong thorny wood, and are no nearer bearing fruit than when only one year old."

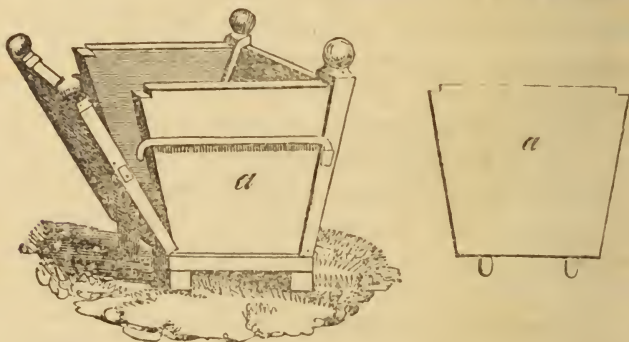
The orange, like most other plants, has its peculiar insects, who often commit sad devastation on them; and, in common with most every plant, is much infested with *Aphides*, particularly on the young shoots and leaves. These latter are, however, easily got rid of, as a powerful fumigation of tobacco will destroy them without the least injury to the tree. The insects which are by far more to be dreaded, are of the *Coccus* genus, and not unfrequently several species may be detected upon the same tree. As these insects seem to stand fumigation with impunity, nothing from the ordinary modes of this

application can be expected capable of destroying them. The application of ammonical gas, however, may be considered as an efficacious antidote, but the generation and application of that gas are not yet sufficiently understood by practical men to be brought in as a remedy against these insects. Washing the leaves often with a pretty strong lather of soft soap, applied with a sponge or soft brush, is very effectually used for their suppression; and although it be a tedious method, it has the merit of being effectual. In regard to shifting oranges, we suspect that as much injury is done by a too frequent recurrence to that practice as almost by a total neglect of it, as fine oranges are to be met with which have not been shifted for many years. The necessary supplies of nutriment which they require, should therefore be applied in form of liquid manure, or by frequently top-dressing the surface of the pots or tubs with sheep's dung, or similar stimuli, which will be carried down to the roots gradually by each watering. The continental orange-cultivators frequently grow them in boxes, in which they are allowed to remain until the box becomes quite rotten, and not unfrequently do they, in such cases, place the rotten box within one of larger size. The decomposing wood, they conclude, supplies the plants with a constant supply of food, somewhat similar to the vegetable-mould which most cultivators use in forming compost for these trees. Broken or pounded bones, horn, and similar matter, appears useful for a like purpose, and such is very often practised with some of the best cultivators in this country.

As a very necessary precaution in planting oranges in pots or boxes, where they are thus to remain for several years, too much care cannot be taken in draining them well, as, if not done in a proper manner before the plant be put in, it cannot be done afterwards, and, if superficially done, will be attended with the worst consequences. For, although the whole orange tribe require at certain seasons a large supply of water, and always appear to thrive best in a damp humid atmosphere, still they are very impatient of too much wet at their roots. We have already observed, that this family do not require much fire-heat; a cool equable temperature is what we have observed them to succeed best in. Abundance of water, par-

ticularly in the growing season, partial shading from the meridian sun, and being not exposed to the external effects of our climate, seem all that is necessary in producing trees as fine as those to be met with in such places on the continent, where they are not cultivated in the open air.

The annexed engraving represents an orange-tub of our own invention, differing from Sir A. Hume's, or those used on the continent; and their particular make, as they taper a little, gives them a lighter appearance than when made square. The



advantage that this sort of box possesses over those in common use, is, that they may be taken to pieces with very little trouble; the roots of the trees may be examined; the old ones removed, and replaced by fresh mould; the roots may be pruned, and it may be immediately ascertained whether they be in a proper state as regard moisture, &c. The last particular we consider to be very material to their health; and as the sides fold down, the inside of the boxes may be painted or pitched as often as it may be judged necessary; and if this point be properly attended to, and the boxes be made of good wood, they will last above twenty years. Another great advantage which they possess over the boxes alluded to, is, that the trees may be taken out of one box and placed in another without taking them to pieces, which cannot be effected with the others, as they are made of strong framed posts, so joined that it is impossible to take out the trees; independently of which, only two of their sides are moveable. In taking this box to pieces, it is only necessary to pull up the two iron bars,

and by quietly pulling out two of the sides, the remaining sides (a) lift up. It is our general practice to fill the bottom of the tubs with broken bricks, tiles, and turf, for draining, so as to be level with the top of the bars.

PROPAGATING GREEN-HOUSE AND CONSERVATORY PLANTS.

The plants put into a mild temperature, as recommended last month, with a view to produce young wood for the purpose of making cuttings, will be by the middle of this month in good order for that purpose. Most of them will be so, when they have attained the length of from two to four inches, according to their kinds. Pots should be had in readiness for their reception, by being perfectly drained, and filled with mould proper for each respective plant. The majority, however, strike root in pure white sand, into which the cuttings are planted without any other mixture whatever. When the cuttings are taken off the mother-plant, they should in all cases, excepting such as bleed very much, (as most species of *Euphorbias* and other *Lactiferous* plants, which discharge a quantity of white milky blood or juice,) be planted as soon after taken from the plant as possible. In preparing the cutting, a very sharp knife only should be used, wherewith to cut off all the leaves as close to the stem as possible, without wounding it, as far up the cutting as it is intended that it should be placed in the sand or mould, leaving a few of the top leaves entire, for the necessary purpose of allowing the free respiration of the plant to go on. This observation is particularly directed to all evergreens, whether tender or hardy, and a want of attention to it seems the principal cause of the failures that occur in propagating that denomination of plants. It may be laid down as a rule, from which there are few exceptions, that no cutting should be deprived of all its leaves, neither should they be shortened, although we daily see it practised. When sand is used to plant the cutting in, it should be first pressed down tight into the pot, and afterwards well watered previously to the cuttings being put in; and if water be applied after they are planted, with a view to settle it round their stems, the glasses should not be put on

them until the leaves are again perfectly dry. Neither should the depth of sand be more than just equal in depth to nearly the length of the part of the cutting inserted in it.

PLANTS IN COLD PITS OR FRAMES.

Air should be freely admitted to the plants on all favorable occasions, and the process of covering carefully attended to, for we have often very severe frosts during this month. Clearing them of dead leaves, dampness, and turning them about towards the sun, must be also attended to.

Some of course will have been destroyed, from particular causes, during the winter, and when such is the case, they should be removed, when it is accurately determined, which will give more room to the remainder, and allow a better circulation of air to pass through them; independently of which, it will give a better appearance to those which remain. It very usually happens that, from want of proper draining, or other causes, the water given them does not pass freely through the balls, but stagnates about the roots; and when such cases occur, the plants should be taken out and repotted as soon as they are observed to be in that state. Those plants which are intended to be extensively increased, for the purpose of planting out in the flower garden, should be selected and placed in a mild hot-bed, to set them into a growing state, in order that cuttings may be sooner obtained of them, so that the young plants, so originated, may be strong enough to plant out in the borders, as soon as the season will admit of it.

MARCH,

TEMPERATURE.

Unless in unusually cold weather, little or no fire-heat will now be required in either of these departments, and that little only must be applied on evenings when there is an obvious appearance of frost; or sometimes in the morning early, when unforeseen frost may have partially entered the house; but, in either case, it should be applied with caution. When some of the plants nearest the glass may have been slightly touched with frost, the cultivator will remedy the evil by sprinkling or slightly syringing such plants with cold water as early in the morning as possible, after the cause has been ascertained; this will gradually thaw the leaves, and, if done before the sun or fire-heat begins to act upon them, will remedy the evil without endangering the loss even of the leaves.

VENTILATION.

Every fine day, at this time, particularly towards the end of the month, the ventilators should be freely opened, and also some of the sashes, to an extent in proportion to the warmth of the day; and the doors or sashes of the conservatory should also be opened in the same proportion. Every day air now becomes of greater importance to the plants, which, without it be given in abundance, would be drawn up sickly and weak.

WATERING.

This necessary element must now, to both compartments, be more freely administered; as many of the plants in both houses will be beginning to grow, and a deficiency of it would be attended with the most injurious consequences. Some plants, let it be remarked, will, however, still require it in moderation; but this can only be learnt by observation. All that can be

directed upon this subject can never be applied as a general rule, to which there are so many exceptions. However, we may infer that plants require water, not in exact proportion to the season, but to the state of growth in which they are individually, whether considered in the natural precocity of their growth, or their state of health. Those plants, for the most part, which are still in a dormant state, will require to be kept nearly as dry as they have hitherto been during the winter, and those which are in a sickly state may come under the same head; such, however, as are beginning to shoot forth should have it administered to them less sparingly, and those which are considerably advanced, or in full growth, should have it in abundance. Watering over the head should, in most cases, not yet be much indulged in; but if found necessary, from the situation of the house, or other causes, that is, if the foliage becomes dirty or much covered with dust, a slight use of the engine or syringe cannot be dispensed with; but this operation should be performed on a fine day, when an opportunity may occur of freely ventilating the house to dry up the superabundant moisture; and when such an operation appears to be necessary, it may be well to suspend watering at the roots for a few days previously.

SHIFTING AND REPOTTING GREEN-HOUSE PLANTS.

Many cultivators, who may be considered skilful in other respects, practise what they call a general shifting or repotting their green-house plants once, and many twice a-year. We have, however, in another part of this work, reprobated the idea of this mode of general shifting, as all plants do not grow equally fast, as well as that all plants do not vegetate at the same period. It would, therefore, be in unison with good culture, never to attempt such processes generally, but individually, for many plants only require to be repotted once a-year, some not so often, but by far the greater number, especially of young plants, will require this operation twice, thrice, or oftener, during the course of one season. It is, however, good practice to make a general survey of the collection at this time, and having picked out such as appear to be in want

of room, either for the purpose of attaining greater bulk, as is the case when large specimens are desirable, or what is more generally the case, as regards green-house plants, to give them additional strength, in order to enable them to produce a stronger bloom of flowers, as well as to keep them in general good health; then, having made the proper selection, they should be carried to the potting shed, and, as it is presumed that pots of different sizes are likely to be wanted, as well as that different sorts of mould be had in readiness, the operation may be proceeded in. In the first place, the mould should be dry, indeed it never can be too much so, at this season. In the second, the pots should be properly drained, that is, by placing one large piece of broken fragment of pot or oyster-shell over the hole in the bottom of the pot, with its concave side undermost; over this a handful of smaller pot-shreds should be placed, according to the size of the pot, and over them a portion of rough turfy matter, broken into small pieces, the more fibrous the better. Formerly, when the practice of sifting the mould for these purposes was in vogue, the larger pieces which did not pass through the sieve in the process, were made use of for this purpose: but now, as that practice is justly exploded, as being injurious in the extreme, pieces of turfy matter are kept on purpose for this use. In the third place, the sizes of the pots should be chosen according to the size and natural habits of the plant. The careless and indolent may find an excuse in potting plants into too large pots, as it saves them the trouble of repeating the operation so often; but no part of the cultivation of plants, of whatever sort they be, is so bad as this. Some, however, may meet this accusation by remarking, that plants turned out of small pots into a conservatory border, or into the borders of a flower garden, succeed perfectly well: this we grant readily; but the cases are widely different, and those who have attempted to grow large and fine specimens of exotics, by planting them in very large pots at once, have been grievously mistaken in the result. Pots are graduated into equal divisions or sizes, from the smallest, which are called small thumbs, or thimble pots, about two inches diameter, to the largest, which are denominated *ones*, or number ones, and which are from fourteen inches diameter and upwards. What

those divisions, so exactly made, were originally intended for, or at what period of the pottery art they were adopted, is not very satisfactorily known; but it is of the less importance, seeing that this division into sizes is both useful and convenient, alike both to the potter and to the horticulturist. It may be laid down as a rule that, in the process of shifting plants, those that occupy the size called large sixties, should be shifted into those called small forty-eights, which is the next size larger, and so of the rest. It, however, sometimes, and indeed often happens, that a greater shift may with propriety be made, but this will depend entirely upon the state of the plant, its nature, health, and habits. Henderson, of Wood Hall, who, with Mr. M'Nab, the very intelligent carator of the Edinburgh Botanic Garden, have carried the culture of the genus *Erica* to a greater degree of perfection than any other cultivators, makes the following remark upon shifting plants, in the Caledonian Hort. Mem. "Never shift any plant till the pot be full of roots;" and, *en passant*, this holds good with all plants, "when the plants get large, several of them will continue in good health for three or four years without shifting, and flower well. I have," he says, "plants of *Erica retorta*," a rather delicate species, "in pots seven inches diameter, which are very bushy, being eighteen inches across, and fourteen inches high above the pot. *Erica infundibuliformis*, two and a half feet in diameter, and two feet nine inches high. *Erica pilosa* between five and six feet high, and three feet across, in pots eleven inches in diameter. These have not been shifted for five years, and are in high health, and covered with strong fine flowers, from the mouth of the pot to the top of the plant."

We may here also observe, that nothing looks so preposterous and bad as a mere twig stuck in the middle of a huge pot, which is sufficiently capacious for a plant ten times the size.

It is, however, only upon extraordinary occasions that a greater shift can take place at once, than that from large sixties to large forty-eights. Sickly or slow growing plants may be often benefited by being taken out of one size, and the ball reduced, the roots pruned and singled out, and repotted again into the same sized pot. *Ericas*, and similar feeble-rooted plants, seldom require a greater shift than from one size to that next

above it, while strong fleshy rooted plants, biennials and annuals, may require a shift of two sizes, but certainly not more at once. Much has been said upon composts and compounds in which to grow certain plants, and many of those which are proposed are as ridiculous as they are useless. All plants grow in soils prepared for them by nature, and are of the simplest description. It has been remarked by one of the best writers on this subject, that out of the three simple earths, viz. pure sand, heath, or what is more generally, although less correctly called by the name of bog-mould, and virgin loam, composts may be made suitable for any plant; aquatics, orchedious, and parisatic plants only excepted. From these three compounds, with the addition of vegetable mould, or rather the mould of decayed tree-leaves, and which, when perfectly decomposed, have been denominated by a late cultivator, if not the *primum mobile*, at least the *secundum mobile* of vegetation, can be made of suitable texture for any plant entering into green-house or conservatory collections to thrive in, provided all other parts of their culture be equally good. Dung, and every species of manure, are seldom used, and never when the end in view is to have neat small flowering plants; but sometimes, for individual purposes, and often in regard to stove plants and oranges; but, in either case, it cannot be even too much decomposed or ameliorated. As a general rule, but from which there are exceptions, we may state that most of the plants from New Holland, New Zealand, Van Dieman's Land, &c., including the heaths from the Cape of Good Hope, will succeed perfectly well in bog or heath mould, without any other mixture whatever; and they are also found to succeed equally well in a mixture of that mould, and virgin loam in equal proportions, or nearly so, or with the addition of a part of pure white sand, in proportion as it is wanting in the former, and according to the strength of the latter.

There are also light sandy moulds to be met with upon many heaths, and in many parts of the country, in which all of these plants will grow; of this kind of barren mould, that from L'eping Forest, about Wanstead House, may serve as an example; it is this mould alone that has been used so successfully in the Clapton Nursery and elsewhere for some years. It is not the

colour but the texture that should be attended to in the selection; and that which retains just sufficient moisture, and no more, is to be preferred. When the water passes through the mould in the pots too rapidly, it may be considered too light, and to correct this fault, loamy earth should be added in proportion; upon the other hand, when the water does not pass through it, but remains long damp, and becomes sour at the roots, it is then too strong, and sand should be added until it be also corrected. Almost all plants will vegetate from seeds in vegetable mould, and many will continue for a long time to prosper in it afterwards, but by far the greater part like a soil of greater consistency, and one formed of light loam and heath-mould, with the addition of sand, may be considered the most general. Some few plants prefer pure virgin loam unmixed, provided it be light, and not approaching to clay; of this description we may instance that splendid, but much neglected, genus *Protea*. In preparing mould for potting plants, as observed above, it should never be sifted, for, by this unnecessary operation, all the fibrous rooty matter, which is true vegetable fibre, and the best food of plants, is rejected. Instead, therefore, of the sifting process, let the mould be chopped with a sharp spade, and well broken with the back of it, and it is then in fine condition for use. The vegetable fibre contained in such mould will supply an extra supply of food to the plants, while it remains open and capable of admitting the roots to ramble about without restraint; and by rendering the mass less solid, enables the superabundant moisture to pass freely through it; whereas, if sifted, the better part of the mould is thus kept back, and the whole mass soon becomes consolidated and incapable of admitting the water to pass through, which either retains it till the whole mass becomes sodden and sour, or, if perchance it be neglected in the watering, the ball becomes so hard and impenetrable, that the succeeding waterings cannot act upon it, and, as a consequence, the plant perishes at last for want of that necessary element. While the process of sifting the mould was obstinately persisted in, we recollect to have often seen hundreds of heaths weekly lost from this cause alone, for many consecutive weeks, in one of the first nurseries in the world; and, as a last remedy, we recollect having seen them

put into a pond by dozens, to become sufficiently moistened again.

When the whole intended to be shifted are finished, they should be staked up, if necessary, and well watered over head with a fine rose watering pot, both to clear them of the dust and filth that they may have accumulated during the process, as well as to settle the mould at their roots. They are then in fit condition again to occupy their places in the green-house.

PROPAGATING GREEN-HOUSE PLANTS.

Under this head it will be readily understood that we include those of the conservatory also, as all plants destined for the latter are propagated along with, and indeed are cultivated with the former, until their size either renders them unfit for remaining longer amongst them, or when of a proper size and age to be planted out permanently in the latter.

To enter into the detail of propagating green-house plants individually, would far exceed the limits prescribed to us, and, indeed, justice could only be done to such a subject in a separate volume. The cultivator who intends to propagate upon an extensive scale, cannot do better than consult the *Exotic Gardener*, by Cushing; or the *Botanical Cultivator* of Mr. Sweet, both excellent practical propagators and cultivators, and whose works on this subject are complete of their kind. The former is now becoming scarce, and would be a valuable work if revised up to the present time.

This is now a very favorable season for commencing the work of propagation, either as regards the mode of rearing from seeds, or propagating from cuttings, layers, or dividing the plant, and also for the more expeditious method of grafting, inarching, or budding.

For the propagation of plants, Mr. Sweet offers the following rational remarks: "A small house should be appropriated, a north-eastern aspect is preferable to any other, so as to have the morning sun, and none afterwards; they then want no artificial shading, for the less sun that cuttings have before they are rooted, and the more light, the better. A pit might be made in the house, and one part filled with fresh tan, another part filled

with rotten tan, and the third with mould." It is evident that this intelligent cultivator is here alluding to nursery cultivation, to which he was attached at the period of his writing on this subject; but we would suggest to private cultivators the mode adopted by us at this very time in the gardens of H. R. H. Prince Leopold, of Saxe Coburgh, which is the application of one or more common garden frames, according to the extent of the intended increase. But to return to Mr. Sweet's directions: "In the fresh tan might be plunged, under hand-glasses or bell-glasses, any cuttings of plants requiring heat; in the rotten tan, under bell-glasses, any kinds not requiring heat; and in the mould, under hand-glasses, large cuttings of green house plants, &c., which require no heat. Cuttings, particularly of woody plants, root best in fine sand, and are safer to pot off after being rooted, as the sand shakes clean from their roots without injuring them. When planted in mould, the roots are apt to break off in parting them; but some of the herbaceous or soft wooded kinds will not root well in sand, and must, therefore, be planted in mould. Cuttings must be put in when the wood is fit. Some kinds root freely in either young or ripened wood, other kinds will only strike in very young wood, and others only in ripened wood. From Christmas to April may be considered as good a time as any to put in most kinds of cuttings, as they root more freely before the weather gets too warm; but some kinds require to be put in every week throughout the year. No leaves should be taken off or shortened, except on the part that is buried in the ground, when the closer to the stem they are taken off the better. The more leaves a cutting has on it, the sooner it will root, though the majority of propagators trim up these cuttings like a parcel of naked sticks, which is the very reason of their not succeeding. The shallower cuttings are put in the pots the better they root, if they be but well fastened; if planted deep they are more likely to rot or damp off; the sand or mould in which they are planted must be kept moist, but not too wet, and the glasses must be wiped occasionally, for too much moisture on them will make the cuttings turn mouldy, and rot off, even after they are rooted. When the young plants are rooted, the sooner they are potted off the better, in as small pots as they can safely be got into;

for, if left too long in the cutting pots, the sand is apt to injure their roots. When they are first potted, they should be kept under a close glass for a few days, or in a frame on a gentle hot-bed, and shaded from the sun with a mat till they have taken fresh root, (this last is particularly applicable to cuttings of stove plants,) then harden them to the air by degrees. When the young plants are drawn up too slender, their tops should be pinched off, which will make them grow bushy. It is always best to top plants when young, if wanted to make them grow 'bushy;' if left to run up high, the knife must be used, which causes a wound that sometimes is unsightly. No leaves should be taken off the plants in this state, except decayed ones, for it weakens them very much. Taking off a large leaf from a young plant will generally kill it, a circumstance," as Mr. Sweet observes, "with which few cultivators are acquainted."

The majority of shrubby plants will increase by cuttings of the branches, although there be exceptions to this rule in some of the species of *Acacia*, and some others, when cuttings of the roots are made use of as substitutes; and some species of plants, which are generally easily propagated, such as *Polygonum*, require the same means of propagation, of which *P. triste*, *gibbosum*, and some others, may serve as examples. Some numerous families, such as *Erica*, are, for the most part, propagated from cuttings of the young wood, and the remainder from seed. Upon the propagation of this delightful genus, that successful cultivator, Mr. Henderson, of Wood Hall, near Glasgow, offers the following remarks:—"The month of July is a good time for putting in most of those cuttings; but they must not be taken off till the young wood be firm. Cuttings of *Ericas* may be put in at any time when the wood is in a proper state." Many of them will be so by the latter end of this month, and sometimes some species are forwarded in a little heat, so as to enable their propagation to commence as early in the season as possible, that they may be fully established in pots before the commencement of winter. But to return to Mr. Henderson's mode of propagation: "Take the cuttings off the plants, about three-quarters of an inch long, *pulling* them off downwards, strip off the leaves nearly half the length of the cuttings; place the cutting on the nail of the thumb, and, with

a sharp knife at right angles, cut off the small end, close to the joint or place where it was pulled off the plant. Having done this, plant them into a pot filled with small pit or river sand, giving them a good watering to settle the sand about them. Set them on a shelf where they are a little shaded, cover them with glasses, and notice to keep the sand always moist. Some of them will be well rooted in three months, and others will require six months before they are fit to pot off." Mr. W. B. Page, of the Southampton Nurseries, an intelligent cultivator, and who was educated in the first school in Europe for the cultivation of this genus, observes: "A prejudice having spread that the culture of these plants is difficult, one of the greatest ornaments of the green-house has hence of late been neglected, although the method of culture be as easy and nearly as certain as that of the geranium, but requiring a little more delicacy in the execution." Indeed, the whole process of propagation by cuttings, requires a deal of nicety in the operation, as well as a constant care during the whole process; and though long practised upon such plants as the willow, the vine, and many others, which must have been pointed out to man by Nature soon after his creation, it was, however, so little known when applied to delicate exotics, that fifty years ago, even in this country, it was scarcely known but to a few of the most eminent gardeners. Upon the subject of propagation by cuttings, as it may be supposed to interest a great part of our readers, the following extracts from that valuable work, the *Encyclopædia of Gardening*, may be both interesting and useful:—"In respect to the choice of cuttings, those branches of trees and shrubs which are thrown out nearest the ground, and especially such as recline, or nearly so, on the earth's surface, have always the greatest tendency to produce roots. Even the branches of resinous trees, which are extremely difficult to propagate by cuttings, when reclining on the ground, if accidentally or otherwise covered with earth on any part, will there often throw out roots, and the extremity of the lateral shoot will assume the character of a main-stem, as may be sometimes seen in the larch, spruce, and silver fir. Cuttings then are to be chosen from the side-shoots of plants rather than from their summits or main-stems, and the strength and health of side-shoots being equal, those nearest the ground

should be preferred. The proper time for taking cuttings from the mother-plant is when the sap is in full motion, in order that, in returning by the bark, it may form a callous or protruding ring of granular substance between the bark and wood, whence the roots proceed. As this callous, or ring of spongy matter, is generally best formed in ripened wood, the cutting, when taken from the mother-plant, should contain a part of the former year, or in plants which grow twice a-year, of the wood of the former growth, or in the case of plants that are continually growing as most evergreen exotics, such wood as has begun to ripen or assume a brownish colour. This is the true principle of the choice of cuttings as to time; but there are many sorts of trees, as willow, elder, &c., the cuttings of which will grow almost at any season, and even if removed from the mother-plant in winter, when the sap is comparatively at rest. In these, and other trees, the principle of life seems so strong and so universally diffused over the vegetable, that very little care is requisite for their propagation. Cuttings from herbaceous plants are chiefly chosen from the low growths which do not indicate a tendency to blossom; but they will also succeed in many cases when taken from the flower-stems, and some rare sorts are so propagated." The leaves of some plants, especially such as are succulent, will form plants, such as *Bryophyllum*, *Hoya*, &c.; and the late Professor Thouin observes, that the same may be stated of certain flowers and fruits.

In the case of plants which do not readily protrude roots by cuttings, artificial means are sometimes made use of to induce this disposition in them; several curious notices have appeared in the Transactions of the Hort. Soc. upon this subject. Ringing the cutting, that is, if a piece of the bark in form of a ring be removed off the cutting previously to its separation from the mother plant, a callous will be formed, which will readily emit roots when taken off and planted in the ground; and it has been conjectured that a ligature would operate in a similar manner, though not so effectually, if made to encircle the shoot destined for a cutting, and should be taken off when an accumulation of sap has apparently been produced. In either case, the cutting should be amputated

below the circles, and the cutting should be planted so as to have the callous covered with mould.

The situation and position of cuttings, when placed in the pots, form no unimportant part of the process of propagating. By this means many kinds of cuttings will strike roots, when planted so close to the edge of the pot as to come completely in contact with it, that would not succeed if planted ever so carefully towards the middle of the pot; and others, when planted in the earth, will seldom, if ever, throw out any roots, but will most readily, if so planted that their base or lower end touch the bottom of the pot. This has been exemplified by correspondent in the Hort. Soc. Transactions, in the case of eleven cuttings of oranges out of thirteen, which he rooted by this method, and afterwards by placing them in a moist heat. Some cuttings will root freely, when so placed, in a pot of sand, that either their sides touch the sides of the pot for their whole length, or their lower end come in contact with the broken potsherds or pebbles with which it is drained.

A friend of ours has succeeded in striking pots full of *Ericas* by selecting the bottom of a flower-pot, and so placing it within the pot for the cuttings, that the lower ends of all the cuttings touched the buried part of the pot, the cuttings being planted in pure sand.

PROPAGATING BY SEEDS.

This is the mode pointed out to us by Nature; but as many of our finest and rarest plants do not even flower with us, much less perfect their seeds, other methods have been had recourse to. When seeds can be ripened with us, or when they can be procured from abroad, it is the means of obtaining plants in the greatest numbers, and the only method of obtaining new or rare ones. On this head, Mr. Sweet observes:—“Where seeds are received from abroad, some of them should be sown immediately, whatever season it may be; for sometimes seeds will grow when first received, which will not if kept some months longer: but the general time of sowing should be early in spring, that the plants may get strong before winter. A gentle hot-bed is best for bringing up most of the tropical kinds, but some few will come up better on a

THE QUEEN PINE

PLATE 1



Grown in the Garden
of W. H. Fisher, Liverpool.
Examined by E. S. South

FIGURE 1. Queen Pine Fruit, showing the crown and leaves.

shelf or on a flue of the hot-house. The sooner seedlings are potted off the better, as they do not miss their moving when potted off very young." Seeds from temperate climates, such as New-Holland, and similar countries, such as the Cape of Good Hope, &c., vegetate best in a cool temperature, rather moist than dry; for which purpose, houses with a northern exposure, or nearly so, are preferred. Most of these will vegetate freely in peat-earth, if finely sifted, and kept moderately moist and shaded, but the time of their vegetation is very uncertain; some appearing in the course of a fortnight or three weeks, others not in eighteen months, or even two years. Many experiments have been tried to hasten their vegetation, but none with very great success. Thick-shelled seeds, such as *Banksia*, &c., have been scraped nearly to the quick with a knife, and steeped in a chemical preparation with as little success. Steeping in milk and water may soften the shells of some seeds; and if it do them no good, cannot do them any possible injury. When seedling-plants appear above ground, they should be regularly and carefully watered with a fine rose watering-pot, but this operation should never be performed when the sun is shining on them.

PROPAGATION BY LAYERS.

This is a mode of propagation to which recourse is had in the case of such plants as do not freely strike root from cuttings, and it is best performed in spring, before the ascent of the sap; or, if not performed then, may be done with equal advantage when the sap is fully up, so that, as far as regards the plants under consideration, February and March, in the former case, and June and July in the latter, are considered the proper seasons. The processes of laying are various, and applicable to most shrubby plants and trees. Green-house plants are generally layed either in the pot in which the plant grows, or more frequently in others that are filled with mould and brought close to it. In either case, the shoot intended to form the future plant is bent down, and a portion of it buried in the mould, in which position it is secured by means of a hooked peg. Sometimes the part of the branch

buried in the mould is slightly notched, split, twisted, or otherwise mutilated, and sometimes it is put under the mould without any cutting whatever. "If the cut or notch," says an author on this subject, "in the stem does not penetrate at least half way through, some sorts of plants will not form a nucleus the first season; on the other hand, if the notch be cut nearly through the shoot, a sufficiency of alburnum or soft wood is not left for the ascent of the sap, and the shoot dies. In delicate sorts it is not sufficient to cut a notch merely, because, in that case, the descending sap, instead of sending out granulated matter in the upper side of the wound, would descend by the entire side of the shoot; therefore, besides a notch formed by cutting out a portion of bark and wood, the notched side is slit up at least one inch, separating it by a bit of twig, a small splinter of stone or potsherd." Plants originated by layers, are not afterwards so likely to produce fine specimens as those originated by the other modes of propagation; but there are some which we are necessitated to produce in this way, because they are more difficult to propagate by any other.

PROPAGATING BY BUDDING, GRAFTING, AND INARCHING.

Many plants are propagated by one or other of these means; but as they have been already described in the *Fruit Garden*, any notice of them here may be deemed superfluous. We cannot, however, omit noticing a very ingenious mode of grafting, described by M. Oscar Leclerc, of the Jardin du Roi, Paris, in a communication to the editor of the Gardener's Magazine, and said to be the invention of Mr. Blaikie, an eminent British gardener, who long resided in France, and who may be considered as the founder of modern gardening in that country: "This mode of grafting," observes M. Leclerc, "which I shall henceforth call the *Graffe Blaikie*, succeeds in most plants, both of the hot-house and open air; and it seems particularly well calculated for the propagation of intertropical plants and trees. The success which attends it on delicate hot-house plants, and particularly on those which are hard-wooded, is very difficult to be obtained by any other

means. During the time when the sap is in full activity, the scion must be procured, if possible, of exactly the same diameter as the stock on which it is to be grafted.

“First make two lateral oblique incisions, exactly similar, the one on the stock from above to below, the other on the scion from below to above, and both sloping from without towards the centre or interior of the wood. The tongues are then cut in form of a long wedge, by stripping them of their bark. The cut parts are then re-united, taking care, as usual, to make them coincide as exactly as possible. The scion being bound by ligatures to the stock in the ordinary way. The inferior part of the scion, that is, the lower, is plunged in a vessel of water. It will, however, be necessary to remove the water from time to time, and to renew the base of the submerged scion by cutting off its extremity.

“The stock is sometimes headed down immediately after the operation, in which case, particular care must be taken to leave a bud or a shoot above the incision, in order to attract the sap to the place where the operation was performed. Sometimes, however, the stock is not headed down till after its union with the scion is completed.

“When the plant operated on is small, and the scion of a delicate species, the plant should be covered with a bell-glass to prevent the too great transpiration of the leaves. The air in the interior must be occasionally renewed, as, without this attention, it would, by the evaporation of the water, be rendered too humid. If the diameter of the scion be less than that of the stock, the operation must of course be different from the preceding. In such a case, the incisions must be limited simply to two longitudinal ones, of equal dimensions, one on the scion, the other on the stock. This is the easiest and the most natural mode, and also the most favorable for giving solidity to the graft.”

This mode of grafting is, we think, particularly applicable to oranges, lemons, &c., and these plants, engrafted by any of the ordinary methods, that will admit of a portion of the scions being left long enough to be inserted into a phial or cup of water, will facilitate the operation. Some cultivators practise this mode of engrafting in this country; and a variety of

it may be noticed as practised by that intelligent and indefatigable botanist, Mr. Murray of Glasgow, who substitutes for the water a potato or turnip, into which he inserts the bottom end of the scion. Some propagators have recommended inserting the lower end of the scion into the mould of a pot, kept at a proper degree of heat and moisture; and in some cases where this has been practised, the scion has rooted into the mould, and where such has occurred, the part below the union of the graft has been cut off, and has consequently produced a perfect plant, giving thus two plants instead of one. Instances have also occurred of the scion rooting into the water, and in like manner producing a plant. It may be mentioned, as a necessary precaution in the above method of grafting, that to prevent too rapid evaporation, produced either by the sun or winds, a cap of stout paper or parchment has been recommended, which may be fixed a little below the part operated on, and so contrived as to enclose the whole of the upper part of the stock. This precaution becomes particularly necessary when the operation is performed in the open air, and particularly in the case of resinous or gummy trees.

Of the plants which belong to those departments, which are propagated by these methods, may be enumerated the families of *Camellia* and *Citrus*, the varieties of which are for the most part propagated by the two latter methods, as are some species of *Daphne*, *Berberis fascicularis*, and various others. Sometimes grafting is performed on the roots of some rare plants, as in the case of *Pæonia papaveracia*, which is often grafted on pieces of the roots of *Pæonia moutan*.

Experienced operators propagate plants by these means with much success, and indeed the idea of increasing the size of a *Camellia*, for example, to an almost unlimited extent, by inarching very large branches, or, in some cases, entire plants upon others of greater size, appears to us to be perfectly practicable. As the size of these plants adds to their value, and as they are several years before they acquire a large size, however well they may be cultivated, this mode of increasing them certainly deserves to be more generally adopted. No plant, that at present adorns our conservatories,

has greater claims on our attention than the one in question, and there are few who have seen the two splendid specimens of this plant, which were long and scientifically cultivated by Mr. Knight, the surviving one of which is now exhibiting in the Colosseum collection, and which has above thirty different varieties growing upon it, but who would be ambitious of possessing similar specimens. Large specimens of Camellias, and of several other plants, are more likely to be quickly attained by a process of this kind than by any other. The precise season of performing the above operations on exotic plants, will always be governed by the state of the wood on the plants, and by no stated period of the season. When the wood or buds are in a fit state, which has been described in the *Fruit Garden*, then the operation should be proceeded with.

PROPAGATING TENDER ANNUALS.

Tender annuals are plants of one year's duration only, as the name implies; and those termed tender, in contradistinction to hardy ones, are those which are natives of tropical or very warm climates. Much of what has been said on rearing annuals in the *Flower Garden* is applicable in the present instance; and the species which are most commonly cultivated, are balsams, cockscombs, globe and pyramidal amaranthuses, &c.; although many new and very interesting ones have been of late years introduced, and are in many cases, in a certain degree, substituted for them. The above, however, have long been popular flowers; and in every garden, where the convenience exists, a certain portion of them may be expected to be cultivated. The rule laid down for the culture of any one of this description of plants, may be said to apply very generally, with slight modifications.

The seeds, therefore, should be sown any time this month in pots, pans, or boxes, and should be placed in a cucumber or melon-frame, or in one put up on purpose, of an almost equal degree of temperature. The seeds should be sown moderately thick, and covered lightly. The mould should be both light and rich, as the end in view is to have large and

vigorous plants. When the seeds vegetate, water should be daily applied, as circumstances may require; and when of sufficient size, they should be potted off into small pots of light rich mould; the sooner they are potted off after coming through the ground, the better, as they will experience a less check than if left till of greater age or size. The leading feature in their whole management is to keep them growing rapidly; and as soon as their roots have nearly filled the pots into which they are first planted, they should be removed into those of greater size, and so on until they have attained their full size. If kept steadily growing, and abundantly supplied with water, they will not often show a disposition to flower until of a large size, which is particularly to be desired. But if stunted in pot room, or planted in too poor or light soil, or at any time checked for want of sufficient heat or water, they will come into flower prematurely, and consequently be small, and of much less value. Most of them, particularly balsams, thrive in good rotten dung, or, at most, with a small portion of rich loamy earth mixed with it. Some cultivators stimulate them by the application of liquid manure, obtained by steeping the dung of sheep or pigeons in a quantity of water, until it becomes highly impregnated with it. This application is of much importance to them, and is easily applied; however, care must be taken not to allow any of the liquid to come in contact with the stem or leaves of the plants.

Throughout their whole course of culture, the nearer that they are kept to the glass the better, as by that means they will become stocky and not drawn up, which they are very liable to do if not attended to, and in that case would never become fine plants.

A P R I L.

TEMPERATURE.

Fire-heat may now be dispensed with in either of these departments, excepting on very particular occasions, such as drying up any excess of moisture, or occasionally about the beginning of the month to repel any sharp frost, which, though rarely happening at this season sufficiently intense to injure these plants, still, should it so happen, several degrees of less frost would be more injurious to them now, when they are just beginning to shoot forth, than at an earlier period of the season.

VENTILATION.

As the days become warmer, ventilation must be increased in proportion. A want of it at this period would be attended with very injurious effects. Every fine day, for several hours, the ventilators, when used, should not only be opened, but a number of the doors or lights opened still farther, in order to admit a sufficiency of this balm of life. Towards the afternoon, they should be shut up, and that should be done before the atmosphere of the house becomes too cold, as a genial degree of warmth from sun-heat is now necessary to encourage a disposition of growth in the plants.

WATERING.

Water should be more liberally supplied both to the plants in pots, and also to those planted out in the borders, than hitherto; and this must be applied less sparingly, accordingly as the weather is fine, and as the month draws to an end. In fine days, a gentle syringing will be extremely useful to the plants in both departments, to refresh their foliage and to clear them of dust or other filth; but this should only be

applied in the forenoon of very fine days, so that all dampness may evaporate before the houses are shut up for the night.

DESTROYING INSECTS.

Insects of various species and varieties will now be making their appearance, particularly on old stunted plants, and upon such collections generally where the plants are not in a thriving state. In a general way, insects, as we have already observed, are not the cause of diseases in plants, but the effects of it. Healthy and well-kept plants seldom are attacked by them, whereas sickly and ill-managed ones are sure to be infested by them. Some species are more liable to be annoyed by them than others, and Oranges and Camellias, in a particular degree, especially when stunted and ill grown. As the species which attack these are for the most part of the genus *Coccus*, the only effectual method of ridding them is by sponging them off with a brush or a piece of sponge with soap and water, going over the leaves individually. The *Aphis*, or green fly, frequently attacks the young shoots of the former; and in such cases, a safe, cheap, and efficacious remedy is to be found in fumigations of tobacco, or by anointing them with a strong decoction of that narcotic herb. That minute and destructive enemy, the red spider, will not appear, if fire-heat has not been too freely applied; but even then, a free use of the syringe or garden-engine will subdue them, or, what is more rapid in execution, although less agreeable in such structures, brushing the flues over, when heated for the purpose, with flour of sulphur, mixed in water, and applied with a large brush. As this latter remedy produces a very disagreeable smell in the house, ventilation must be freely indulged in for some days afterwards; and when more speedy means are necessary, sprinkling the floors and other parts of the house with odoriferous perfumes, or bringing in, in abundance, sweet-scented plants, such as *Mignonette*, *Neapolitan violets*, &c.

TENDER ANNUALS.

The plants of this description, originated from seeds sown last month, should throughout this be attended to, and

abundantly supplied with water, air, heat, and sufficient pot room, to obtain them in first-rate perfection. As a succession, seeds of all those sown last month should be again sown, and managed as therein directed.

As they will now be increasing in size, and the number necessary in an extensive place being considerable, a separate frame or frames should be appropriated for them, where they can be cultivated with greater advantage to themselves and less injury to other plants. It may be now also necessary to sow in considerable quantities seeds of all this denomination of plants, as many of them will succeed well, if planted out in the borders of the flower garden.

PROPAGATING PLANTS.

As the spring and autumn months are best calculated for this purpose, exertions should be made to forward the putting in of all cuttings intended to be propagated, as after next month the sun becomes too powerful for them to succeed well without a great deal of shading, which is not only troublesome, but never answers the end in view so effectually. However, as we have already observed, there are some that require to be put in every month of the year. Our observation above is applicable to a general process of propagating only.

PROPAGATING ERICAS.

This very interesting and numerous genus is best cultivated, as we have already observed, in a house dedicated exclusively for themselves; and where such is the case, such house is known by the appellation of heath-house or heathery, and to be complete should contain from two hundred and fifty to three hundred species, which will afford a considerable share of bloom throughout the year. Heaths are comparatively of late introduction; for we find that, in Miller's time, few were known, and those only of the hardy kinds: none of the Cape species being at that time introduced. To His late Majesty George the Third we are considerably indebted for the introduction of this charming genus of plants. That mo-

narch, at his private expence, sent Mr. Masson, a most assiduous collector, two voyages to Africa, for the almost express purpose, and by his exertions, the first collection of *Ericas* in this country was formed. The late venerable Mr. James Lee, in company with Mr. Kennedy, of the Hammersmith nursery, may be looked upon as the first professional characters who embarked in this speculation, and their collection was long looked upon as unrivalled in Europe. These were not only the first commercial collections formed, but there also the mode of culture first devised, which has been the means of disseminating them throughout Europe, chiefly under the management and direction of our late ingenious, although unfortunate friend, Cushing. Subsequent collectors have added considerably to this genus; and although last, not least, that indefatigable young botanist, Bowie, who not only visited Africa with a view to discover new species, but also to draw conclusions from their natural habits, to enable us to improve their culture; and from the observations made by him, and freely communicated to us as well as to others, there is no doubt, that had he survived his second journey, this genus, which hitherto has been considered rather difficult to propagate and cultivate, would have been much improved by his valued observations. A genus so interesting, and we may say, so long fashionable, must necessarily have attracted the attention of home cultivators; and from the profusion of flowers, which most of the species produce, and their parts of generation being for the most part so perfect, we need not be surprised at the many hybrides which the care or curiosity of the cultivator has produced. To the valuable exertions of the Hon. and Rev. W. Herbert, we are primarily indebted for many plants of this description; and from his paper upon this subject, in the *Trans. of the Hort. Soc.*, we are led to infer, that this promiscuous impregnation goes on to a considerable extent at the Cape, where millions of them must be in flower at the same time.

Heaths, like most other plants, propagate themselves from seed, although most of those cultivated in this country have hitherto been originated from cuttings; few from layers, and, so far as we know, none have been propagated by grafting,

or similar processes. A considerable portion of them ripen their seeds with us, and there are annual importations of seeds from the Cape. Those seeds ripened in this country vegetate most readily; whilst those imported are often too old, or sometimes injured, before they reach us. As those imported generally reach us in winter, they should be sown early in spring; indeed, some cultivators advise their being sown immediately after their arrival; but we have hitherto found, that if sown too soon, that is, in February or the beginning of March, that they do not vegetate so quickly, and, in consequence, many of the seeds are rotted: for it is a maxim that should never be lost sight of in the culture of this tribe, which is, that artificial heat should be never employed, excepting in some cases of slow growing kinds, that may require a slight heat to draw the young shoots out to a sufficient length for the purpose of cutting; but even in this case, the seldomer that they are so excited, the better.

Artificial heat, therefore, is injurious to the process of originating heaths from seeds; we, therefore, in our own practice, as well as from observation of that of others, prefer the latter end of March or beginning of April for sowing these seeds; the natural warmth of the season then is sufficient to stimulate vegetation, and the young tender plants so originated have not the chance of being destroyed by damp cloudy weather, which we often experience in spring, and which would be of the utmost injury to them in their young state. Where extensive collections of plants are kept up, and in all large nurseries, there is generally a seed-house, that is, one expressly dedicated for the rearing of plants from seeds; such houses are generally low, having a northern aspect, as is the case in the Hammersmith and other nurseries.

Cultivators, who have but few seeds requiring such a structure, content themselves, therefore, with a good garden frame and glasses; and as such is portable, it can be placed where it is either shaded from the meridian sun, or great care taken in shading it artificially. The situation of such a frame should be both dry and airy, for damp would be extremely injurious to the young plants. Pots should be prepared for the seeds, of ordinary sizes, but those known as seed-pots are to be

preferred; they are broad and shallow, which admits of a considerable surface for the seed to be sown on, and of being rendered perfectly dry at bottom. Great care should be taken in draining them, for although the surface will require to be kept pretty moist, still no impediment must be left whereby the superabundant moisture would be prevented from passing freely off. The directions given for draining cutting-pots will be, if acted upon, sufficient for this purpose. The mould upon which the seeds of heaths are sown, should be of the sort called peat-earth, having naturally a considerable portion of fine white shining sand in it, or, if deficient in this material, it should be added to it by the cultivator.

As the seeds are very small, the mould for this purpose, to the thickness of an inch and a half, should be sifted very fine, and the surface of the mould in the pot rendered smooth and level with a small circular piece of board, say of three inches diameter, having a nail driven into the centre of its upper surface, by which the operator can use it to much greater advantage. Upon the surface so prepared, the seeds should be thinly sown regularly all over it, and covered with the same kind of mould to the thickness of one-eighth of an inch, more or less, according to the size of the seeds, as some are larger than others. The pots so sown should be then placed upon the platform in the seed-house, or upon a floor (if in frames) of finely-sifted coal-ashes, and after being gently watered with a very fine rose watering-pot, be shaded from the sun. This shading must be continued constantly on during sun-shine, until the plants be from half an inch to an inch high; afterwards it must be gradually removed to harden them by degrees, to fit them for potting off into separate pots. Some cultivators place bell or hand-glasses over the seed-pots when sown, and when such can be spared, they may be with some propriety used. For five or six weeks, the surface of the mould must never be allowed to become dry, but be daily examined, at the end of which time, the seeds may be expected to have vegetated. When such is the case, the bell or hand-glasses should be gradually removed, first by being lifted up about a quarter of an inch, and increasing this air, until entirely removed. Some seeds of course do not vegetate so soon as others, therefore

the pots should be still carefully attended to; but if after three months, or little more, all hope of their vegetating may be given up. Plants, so originated, will be about the middle or end of September in a fit state to plant out into thumb or thimble pots, as they are called, and which are the smallest sizes that are made.—(See *September*.)

Heaths which ripen their seeds in this country, should be sown as soon as they are ripe, provided this do not occur after the first of September; such as ripen afterwards (and several do so) had better be kept packed up in paper till the following April, when they may be sown as above directed. Plants originated at this time will be sufficiently strong by autumn to pot off; and it is even better then to pot off such as are very small, than allow them to stand in the seed-pots all winter. It is perhaps not easily accounted for, but plants stand the winter better when potted off in autumn in single pots, than if they were to remain in the seed or cutting-pots all winter; and the same rule holds good in regard to potting off cuttings propagated at any period of the year when quite young, that is, immediately after they have commenced making roots. This is not perhaps generally known, at least it is not always acted upon, as many persons, from an idea that the plants will become strong and better rooted, defer too long the process of potting off, and, in consequence, lose both time and many of their plants. It may, perhaps, not be quite out of place here to observe, that such seedlings or cuttings as have originated in the fine white sand of cultivators, should have their roots completely cleared of it before they are potted in their natural mould; for although most plants emit roots in that sand, it becomes injurious to many of them after they quit their cutting or seed state. Directions for propagating by cuttings have been already amply detailed, to render a recurrence to that process here unnecessary.

We may here however remark, that this family are less annoyed by insects than most other exotic plants, still they are not entirely exempt; for that destroying insect, the green fly of gardeners, sometimes attacks the heath, and as it is found impatient of the usual remedy, tobacco smoke, the best cultivators dip the plant, or parts infected, in a decoction of

tobacco liquor. Mildew sometimes attacks the heath; but this, like the cause of its appearance in all other cases, must be owing to damp or stagnation of air. To remedy this evil, has not always been found an easy task; indeed, we recollect, about two years ago, to have seen nearly the whole collection of this family in the nursery of a cultivator, who is allowed to be one of the best in the neighbourhood of London, nearly destroyed by it. Free ventilation and a dry atmosphere seem the basis of a certain cure, and the application of flour of sulphur dusted on the plants, or put on them in form of paste, may be considered as effectual in removing the evil.

CAMELLIA.

This very popular family, like that of *Erica*, *Pelargonium*, and *Orangevee*, has always the best effect when cultivated in a house by themselves; and as there are certain seasons in which this genus requires a treatment almost peculiar to itself, their separate culture is therefore the more necessary. The splendor and profusion of the blossoms of this genus do not only attract our notice, considered merely as an ornamental plant, but has a considerable claim on our more intimate regard, when we consider it as supplying us with one of the necessities of life, and probably one of the most exhilarating and useful medicines of which our Pharmacopeias can boast. From the species *Camellia bohea*, *viridis*, and *sasanqua*, are obtained the well-known tea of commerce, which is imported by us from China, where these three species, together with *C. japonica*, grow in abundance, and in that country attain the character of evergreen shrubs or low trees. From these species have been originated, by cultivation, the many varieties, amounting to no less than twenty-eight, as enumerated in Sweet's *Hortus Britannicus*, besides many others, which have either appeared since the publication of that useful work, or been not altogether definitely settled at the time; one of the latter class, *Camellia japonica*, var. *Chandelarii*, we have chosen for our figure, named in honor of Mr. Chandelar, of the firm of Chandelar and Buckingham, successful cultivators of this genus, and who have originated a collection of varieties from seeds. The

most successful and generally adopted method of propagating this family, is by inarching or grafting; by either of these means each variety is perpetuated, but new varieties are only to be obtained from seeds; and as these seldom ripen, at least in any quantity, in this country, and few are imported in a fit state to vegetate, the propagation of new varieties is consequently a matter of some importance. As, in most other cases, it is from single flowering plants that seeds are to be expected, although sometimes the semi-double flowers also produce them, and of these, the common single red is the most prolific in affording seed. Sometimes seedlings so obtained are used only for stocks, whereon to work other rarer kinds, although sometimes they are kept till they attain a flowering state to ascertain their relative merits. Mr. Knight, of the Exotic Nursery, has shown us many seedling plants thus originated, which assume as yet different characters, so far as the buds, leaves, &c. are concerned, from those from which they have sprung; and, under the management of that very scientific cultivator, every justice may be expected to be done them. These we understand have been principally obtained from the magnificent specimen which he so long and so well cultivated, and to which we have already alluded. Stocks, however, are for the most part obtained by nurserymen from layers of the common single red, which they have often planted out in pits for this purpose, or from plants originated from cuttings of the same or equally common sorts. Camellias are sometimes budded, but for the most part are either grafted or inarched, and in either case, the process of tongueing is dispensed with, as weakening the stock; and that mode of grafting, termed *side-grafting*, is preferred. It may be observed, that, of all the stocks, for this or any other purpose, those obtained from seeds are the best; but, in regard to Camellias, as the seeds are two years in coming up, cultivators seldom wait till such stocks are of proper size to be operated on. Sometimes the double Camellias are obtained from cuttings, but this is both a tedious and precarious method of increasing them.

As to the proper season for grafting or inarching Camellias, the spring is the best, and just at that time when the plants have done flowering and are beginning to grow. This state

of vegetation does not always take place at precisely the same time, as some cultivators force their Camellias into bloom very early; such, therefore, should be operated upon not by the EXACT period of the year, but by the state of the plants. Some will be fit for this process in January, February, March, and April. Those, however, which are operated on in March and April, will have the better chance to succeed, although those which are operated on in February answer pretty well.

During the time the process is going on, the house should be kept rather closely shut up, and the atmosphere kept rather damp; however, these must not be too freely indulged in as in the former case, the plants would be liable to being drawn up weak, and consequently become straggling and of bad habits. The time that elapses before a union of the scion and stock completely takes place is various in different sorts, and more particularly in regard to the state of health and vigour in which the plants may be, as well as the favorableness or unfavorableness of the season. Observation alone can dictate when the clay and afterwards the bandage of masting should be removed. There is an evil in allowing either to remain on too long, as well as taking them off too soon; however, there is less danger to be apprehended from their remaining on a week or even two too long, than in taking them off a week too soon. Some cultivators adopt the *Grafte Elastique* mode of inarching, as noticed in our article on orange-trees, with much success, and others also practise the mode recommended by Mr. Murray of Glasgow, by inserting the lower extremity of the scion into a potato or small turnip. Camellias will form a union when the branches are of considerable size; and, as we have already noticed, very large plants may be speedily formed by inarching several whole plants upon one common stock. This process is now becoming prevalent round London; and when the operation is properly performed, and the plant afterwards properly cultivated, specimens of large size may be expected to become more common than they have hitherto been; and certainly one or two large specimens of this plant, where there is convenience for keeping them, are better than a number of small ones, which take up the same room, and never can produce so imposing an effect as is the

case with large specimens. Upon one or two plants may thus be cultivated the whole collection of varieties and species now known. In grafting Camellias, much care should be taken to perform the operation neatly, so as to leave as little appearance of the place of union as possible. We recollect, when this plant was much less common than it now is, and the methods of propagating it less understood, that some cultivators, to hide this deformity in the stem, performed the operation very close to the surface of the pot in which the stock grew; and when the union had taken place completely, they used to repot them into deep pots, so as to bury the wound under the mould. A practice so unskillful was of course unsuccessful; the plants being thus too deeply potted did not prosper, and, as might be expected, deterred many from purchasing, from an idea that the plants were either short-lived, or would not grow without the care of a proficient person. The case, however, is otherwise: scarcely any plant is easier cultivated than the Camellia; although it must be admitted, that, to grow them in the first degree of excellence, much judgment is required. Camellias, like most other plants, have their periods of growth and also of rest; during the former state they cannot hardly be watered over much, and during the latter, they will soon languish if too bountifully supplied. For this, no rules can be laid down; experience and observation on the part of the cultivator alone can be a safe guide.

GENERAL CARE OF THE GREEN-HOUSE AND CONSERVATORY.

These departments should be kept perfectly clean, and in the highest order for neatness and regularity; a want of it in these departments can never be excused. The floors, stages, wood, and glass-work should be frequently and thoroughly washed, and even the pots should also be kept as clean as if new. All plants should be neatly and naturally tied up, as they may require it. However, no plant that stands erect should be tied up or supported if it does not really stand in need of it. Supporting a plant that can better do without it, is as preposterous as making a man walk on crutches who has the faculty of his legs perfect and complete.

This, however, is daily seen, and even in collections which ought to show a different example. Neither should plants be tied up in a stiff or formal manner, nor contorted into shapes which Nature has never designed. The natural character of all plants is the most pleasing, and those who wish to constrain them into other shapes, betray a great want of taste, and even littleness of mind. Neat sticks should only be made use of, and be so placed in the plant as to be as much concealed as possible. Short pieces of stout wire may be used with great advantage, as it combines strength, durability, and neatness; and bamboo or other canes, used for the same purpose, may be considered an improvement in this branch of exotic culture.

Plants of climbing or creeping habits, such as are employed in covering the opaque parts of green-houses or conservatories, and which are, when in good keeping, their greatest ornament, should be regularly and neatly tied or nailed up as they extend in growth, to prevent them from breaking, and more particularly from having an appearance of confusion and disorder. The different passifloras will be great ornaments to the conservatory at all seasons, as they produce their flowers in great abundance, and some of them even perfect their fruit: of these, *P. edulis*, of which our figure is a representation, is peculiarly handsome, and fruits in abundance, but requires the assistance of the cultivator in assisting its impregnation. The fruit is much esteemed in its native country, and it not unfrequently appears on the tables of the rich in this country. However, the flavour is such as not to be much admired by the majority of persons.

M A Y.

VENTILATION.

Air should be now abundantly admitted during the whole of every fine, and for a great part of every moderate day; shutting up the house, however, before the atmosphere is cooled too much by the chill of evening.

WATERING.

Watering should be applied now more freely than heretofore; and as some plants, while growing, require a very considerable portion of it, it will be advisable to examine the plants in the green-house every morning and afternoon. We presume that it is almost needless here to observe, that flats, pans, or saucers, should *not* be used under the pots; such a practice is so totally at variance with good culture, that none but the most obstinate or ignorant will use them. The plants in the borders of the conservatory will now be growing rapidly, and will require frequent supplies of water, both at their roots and also over their tops, which should be applied with the syringe or garden engine.

MANAGEMENT OF TENDER ANNUALS.

The plants of this description, originated from seeds sown the two former months, should be attended to both as to shifting into larger pots, as well as with water in abundance. (For further particulars, see *last month*.)

REMOVING THE PLANTS OUT OF THE GREEN-HOUSE.

Towards the end of this month, but not sooner, and then only if the weather be fine, and all likelihood of frost be past, many, if not the greater part of these plants, may be

removed into their summer quarters. This is a very old and reasonable practice. Experience, that safe guide, sufficiently proves the utility of the practice; and some plants which are even often inhabitants of our stoves during winter, are benefited by a free exposure to our climate for at least two months of the year. This practice is, however, less prevalent here than on the continent, particularly in some parts of Germany; but even with us it is becoming more general.

All those which are denominated Cape and New-Holland plants, with many of those from China and Japan, are usually turned out about this season, with the exception only of those which are in flower, from which it is desirable to obtain seeds, or when their flowers are either too delicate or rare to be trusted out; such as these are usually kept in the green-house until their seeds be ripe or their flowers faded. The situation in which they are placed when exposed to the sun, without the intervention of glass or other protection, is of much importance. A situation fully exposed to the sun is to be avoided, as well as such as are entirely shaded; and that which is under the drip of trees may be considered the worst of all. A spot moderately shaded by high walls, hedges, or buildings, is to be preferred; but where a display of picturesque taste is to be displayed, situations in the flower garden, shaded from the meridian sun, should be adopted. Here, if they be placed about in natural groups, harmonizing with the surrounding shrubs and plants, the effect will be imposing, and very different from the common practice of crowding them up in some obscure corner, as if hiding them out of sight. Plants, so turned out, should not be plunged in the borders, at least the more delicate and rare species; but as the covering of the pots would be desirable, they may be contrived to be hidden by covering them with moss, different species of *Hypnum*, &c. Two advantages naturally present themselves by this practice; first, the hiding of the pots, which can never well accord with flower garden scenery; and secondly, preventing evaporation from going on too rapidly, which all plants in pots are exposed to when not plunged, and when much exposed to the sun, as it proceeds rapidly not

only from the surface of the mould in the pots, but also from their outer surface all round.

A saving of watering would also be obtained, and the temperature, as well as humidity at their roots would be kept more regular, and of course in fitter condition for the roots to live in. During wet weather this covering might be removed, either partially or entirely, and replaced when more dry and warm. Damp situations will of course be unfit for either of these modes; but let it be also remembered, such situations are unfit for plants to stand in, even although placed on the surface. Coal-ashes or pebbly gravel would be good strata to plunge plants in, as in either there would be but little fear of their roots suffering from damp. Those who prefer the present practice of standing them on the surface, should prepare it for them by laying a floor of finely-sifted coal-ashes or gravel, smoothly rolled down, on which to stand the plants, as either will form a dry bottom for them, and, to a certain extent, prevent worms from getting into the pots; a circumstance to be carefully guarded against. Some collections are arranged upon wooden stages, as was formerly exemplified in the gardens at White Knights; but this practice is objectionable, inasmuch as the pots are far too much exposed to the action both of sun and wind, and the mould in them can seldom for any length of time be kept in any degree of uniform moistness; a circumstance of evident injury to the plants. Such as are tall, and likely to be blown down by winds, or other causes, should be supported as well as the nature of the case will admit; for this purpose, the London nurserymen run a system of cords in different directions, supported by neat rods, through their beds of green-house plants with very good effect; and when the plants are bushy and fine, the cords are not much seen. In arranging plants in pots, some little degree of taste should be displayed, but not of that cast so often met with, of arranging them in geometrical forms, which, like similar figures in flower garden-clumps, have always a stiff and formal appearance. Irregular figures should be preferred, and an irregular outline of surface should also be attended to, and not that stiff shorn sameness of outline which has been the practice for above a century. Fine specimens should be placed in

conspicuous situations, which not only show off the character of the individual, but also aid in giving a more natural appearance to the whole. Very large specimens of exotic plants, such as *Agava*, *Acacia*, &c. will have a good effect, if placed out on the grass portions of the flower garden or on the lawn; but as the pots into which such are necessarily grown are large and would be unsightly, they should be sunk into places prepared previously for them, sufficiently large to receive the pot or tub, and which should be placed upon a brick or two to render their bottom perfectly dry. Such places may be constructed of brick-work, having a cover to be placed over them during the season, when no plants are in them, admitting of a little mould over the cover, upon which turf may be laid, to leave the lawn entire. Or, when a regular system of this kind is adopted, hardy evergreen plants in tubs, boxes, or pots, may occupy them when their more tender occupants are in their winter dwelling. Groves of *Camellias* and *Oranges* may be thus introduced in favorable situations upon the lawn or flower garden with good effect. But where fine specimens of these plants are required or admired, we cannot recommend their being so treated, except upon very particular occasions, and those of short duration. More hardy plants will answer this purpose without injury, whereas either of the two above mentioned can never for any length of time be trusted out with safety.

GENERAL MANAGEMENT OF THE GREEN-HOUSE AND CONSERVATORY.

As the plants are removed from the stages of the green-house, those tender annuals which have been forwarding in frames or other conveniences, should, as they attain their full size, or as they begin to come into flower, be brought in to replenish this department, as well as some of the less tender stove-plants, where such are kept. By the help of these, the green-house will not lose its interest for a single day, and the stove-plants will be much benefited by this free exposure to sun and air, as well as having more room than in their own department.

The tender annuals, particularly some of those latterly introduced, will make a fine show here till the season returns when the green-house plants must again occupy their own place. The conservatory may be kept gay now by the introduction of many of them into it, tastefully arranged through it amongst the other plants, and into such parts of it as were lately occupied by fine specimens of plants in ornamental pots or vases, and which will now be disposed of out of doors. When any of the flowers decay, they should be cut off, where the saving of seeds is no object; and those plants which become old or sickly, should be also removed, and replaced with others in greater perfection. Climbing plants should be attended to and regularly tied up, and all dead or decaying leaves picked off them, and the whole should be kept clean and neat, and all parts that will admit of it duly washed, or otherwise cleaned.

PROPAGATING GREEN-HOUSE AND CONSERVATORY PLANTS.

This is a very proper season for propagating most or all woody or shrubby plants, such as *Banksias*, *Dryandras*, *Metrosideros*, and similar plants, and in particular most of the genus *Erica*, as the young wood of all these species, and most of a similar description, will be in a fit state for the process. As the season is now sufficiently mild for such plants to stand out in the open air, it is also found that the process of propagation goes on much better out than in the house which has become much too warm for them. A sheltered and somewhat shaded situation should be made choice of, such as behind a wall or hedge, but not under the drip of trees. A bed of decayed tan, coal-ashes, or similar matter, should be prepared for the purpose, deep enough to admit the pots being plunged up to their brims; over this bed, so formed, should be placed a close frame and lights, under which the pots should be plunged as they are filled with cuttings. As the pots are plunged they should be covered with hand-glasses, in addition to the bell-glasses over each pot, particularly heaths and similar plants. Hardier or more free-striking cuttings need only be covered with the hand-glasses; and such as are evergreen and large

leaved, such as *Camellia*, *Laurus*, need not be covered at all, as they will strike root better when only covered with the lights of the frame. The frame being filled, or the required number of cuttings put in, the whole should be shaded with mats from the sun daily, and uncovered at sun-set, or nearly at that time.

A very great degree of attention is requisite to be paid them once or twice a-day, from this time until they have all struck root, to shade them properly, and to examine them frequently, to guard against damp, or other disasters, of which they are very impatient. The glasses should be every morning taken off and wiped with a clean cloth, and dried, if at all damp from the condensation of steam. Not only the smaller or bell-glasses require this care, but also the hand-glasses and even the lights of the frame. When any of the pots appear to be getting too damp, the glasses should be removed for a short period, until sufficiently dried. Water they will require only in a very limited quantity, but this must be supplied more freely as they began to make roots.

For plants propagated in May, or even June, this is a very reasonable way; and it often happens, that, from unforeseen circumstances, many will have to be deferred till this time, although, for general purposes, we would recommend the process of propagation to have been commenced much earlier, as already noticed. By adopting the above, an opportunity will present itself of again putting in cuttings, for such as may have failed, amongst those put in during the earlier spring months, and also of increasing such as may not till now have made young wood sufficiently strong for the purpose.

J U N E.

VENTILATION.

The doors, sashes, or other parts of the conservatory, that are capable of being opened, should now be kept open most of the day, except in the case of very cold or windy days, as the plants will require now all the fresh air that it is possible to admit to them. Conservatories that are for the most part portable now begin to show their character, and may be by the middle of the month removed.

The plants which now occupy the green-house, if the hints given last month have been acted on, will require to be ventilated according to the state of the weather. It is yet only on fine days that the sashes can be safely opened to any extent, or for any length of time, as the temporary inmates are impatient of much cold. But as the end of the month advances, it may be more freely indulged in, as they will have become hardier by that time, as well as that the season will have become more genial.

CARE OF GREEN-HOUSE PLANTS SET OUT LAST MONTH.

Watering must be attended to as the state of the weather demands it; during droughts, these plants will require much more water than they did while in the house, as evaporation goes on more rapidly. In time of wet or cloudy weather, they should be less liberally supplied with it, as the same process goes on more slowly. Any of the plants that may have been over-watered, or are become too wet from rain, bad draining, or other causes, should be turned over on their sides, or placed in exposed situations, until they become sufficiently dried up. They should then be examined by being turned out of the pots; and if imperfectly drained, should be repotted, and afterwards replaced in their former situation. Such as require to be supported, should be neatly tied up, and all dead leaves picked off. The surface of the pots should also be kept perfectly clean and free from weeds, and be occasionally stirred

up, which will give them a neater appearance, as well as contribute to the welfare of the plants. Any fine, rare, or curious plants which come into flower, should, if required, be removed into the conservatory, where they may remain till their bloom has faded.

The proper time for watering plants at this season, whether in the house or out in the open air, is the afternoon, as soon as the sun no longer shines upon them, and from that time till the evening. It will, however, often be necessary to water in the mornings also, and upon extraordinary occasions, even through the day. In watering while the sun is shining upon them, care must be taken that none of the water be spilt on the foliage, as it would scald their leaves, and render them very unsightly; and water applied to them during the hours of sun-shine is soon dried up, indeed before the plant has time to absorb enough for its sustenance. Gentle syringing in the evenings, during continued dry weather, will be of much service to them, by cleaning the foliage of dust, and refreshing them at the same time, and will also tend to cool the atmosphere round them, which at this season is of great advantage to them.

Succulent plants may be, when the collection is extensive, very advantageously placed out upon artificial rock-work, and in this way have a good effect; the reflection of the heat from the flints or stones will induce a disposition in them to produce their flowers in perfection. While out of the green-house they will require very little water, none indeed, except in dry weather, as the dews at night and the humidity of the atmosphere will be to them sufficient.

SETTING OUT PLANTS.

Such plants as were deemed too tender to be turned out last month from the green-house, may be by the middle of this month safely set out. Such as stand in need of shifting into larger pots, or otherwise renovated, should be attended to as they are taken out; and such as are in want of support should be neatly tied up, and otherwise treated, as directed for those set out last month.

J U L Y.

The directions given for this department for the last month, is, in every respect, applicable to this also. Any repetition here may therefore be considered unnecessary.

A U G U S T.

GENERAL MANAGEMENT OF THE GREEN-HOUSE AND
CONSERVATORY.

The directions given in the preceding months for the management of these houses, are in every respect applicable to this; and, under good management, both may be kept in a profusion of flowering plants, as the tender annuals and other substitutes will be now in the greatest perfection. To retain the flowers of most of these plants for the longest possible period, they should be abundantly supplied with water; and where convenient, without producing any disagreeable effect, shading them from the sun for a few hours daily will also considerably aid in lengthening the period of their flowering. Those which show a disposition to produce seeds, amongst the annuals, if not wanted for particular purposes, should have the seed-vessels taken off as they appear; for, however curious it may appear, annuals may be kept in a flourishing state for a considerable number of months, nay, many of them may be kept for several years by the simple process of keeping them from forming or perfecting seeds.

POTTING OR SHIFTING GREEN-HOUSE PLANTS.

We have already directed, at an early period of the season, the necessity of frequently shifting or repotting plants; few weeks will pass, where there are good collections kept up, but

this process will be required to some given extent. The plants being out at this time, their several states can be readily ascertained; and if all that require it be now shifted, they will be well established again in the pots before the winter season sets in. This operation is, it must be acknowledged, too generally put off till too late a period of the season, and, in consequence, the plants shifted have not time to make fresh roots to support them during winter, which is the real cause of a great loss in some collections, although it be seldom attributed to it. Many cultivators, however, and amongst them too some of the first London nurserymen, adopt a different plan, but one by no means to be recommended, and that is, to shift only at the times of putting out or taking in the plants, and this plan, they tell us, is to save trouble; but the reward of such a practice is, that many of the plants die, and many more are scorched up by the sun, having few or no roots to support them, and by the end of the season only begin to grow when they are about to be taken into the house; whereas, if otherwise treated, they would have quite a different appearance. By shifting early in the season, say the middle of March, the plants will have filled their pots with roots before they are taken out of the house, and will have made their wood and leaves sufficiently perfect, so as to be little affected by the sun and keener air to which they are exposed. By shifting at this season, as observed above, the plants will have filled their pots with roots before taken into the house, and so be better fitted to stand the winter. At this time they are also liable to send down roots, which, finding their way through the pots, extend themselves in the ground underneath them, and to the inexperienced eye appears to be rapidly improving, many of the robust growing kinds making very luxuriant shoots and leaves; but they would be far better without them, as when they have to be taken up in September or October to be placed in the house, their roots are necessarily broken off, and the plants thus experience a check, which they do not soon recover.

S E P T E M B E R.

VENTILATION.

The evenings will now, particularly towards the end of the month, be beginning to become chilly and cold, ventilation must therefore be attended to, although during the day the plants should be as much exposed as possible; yet, during the night, particularly in wet weather, they must be shut up, at least all the roof-sashes must be closed. If the green-house be kept too much shut up at this time, many of the plants will, if not totally die, at least experience a very great check, and in consequence lose many of their leaves, and some of the more succulent or luxuriant shoots will damp off altogether. As they were gradually exposed to the action of air and sunshine in spring, so must they be gradually weaned from it at this season. In mild weather during the night, the ventilators, if any, should be kept open; and where there are not these conveniencies, the front or end sashes should be left partially open, so as to admit a pure current of air without admitting rain, which would be the case, were the roof-sashes to be opened.

The same rules are to be applied, in a certain extent, to the conservatory also; as the plants have, during the summer, been fully exposed to the air, they should now also be gradually accustomed to a less degree, accordingly as the cold weather approaches. It is only on very mild nights that much air can be admitted after this time; but during every day, until towards the end of the month at least, it should be admitted freely.

WATERING.

Plants in pots will for the most part require less water now than formerly; and those which are denominated succulents, may, with few exceptions, be considered as sufficiently supplied from the atmosphere. The plants in the conservatory should also have it in less quantity, as getting the borders into

a too damp state at this season would be disadvantageous to them. It will now be sufficient, if these plants be watered at this time individually, and not generally, as hitherto, and then only when the surface round their roots appears to be really dry.

REMOVING GREEN-HOUSE PLANTS INTO THE HOUSE.

Towards the middle of this month, many of the more delicate plants will require to be taken into the house, and towards the end, many that are of a hardier nature. This is a process in gardening, like many others, for which no precise rules can be laid down that can be of general application. The season, whether mild or cold, the situation in reference to the exact exposure or the latitude of the place, are all circumstances to be taken into consideration, and must always be left to the good sense of the cultivator. It is always better, however, to have them taken in too soon than left out too long. In the first case, they can be set thin, and abundantly ventilated; but in the latter case, if left out to be nipped by the frost, or the roots chilled with cold and wet, many of them will to a certainty perish, and all will be injured in a greater or less degree. As a general rule, all succulent plants should be taken in first, as being more liable to be soon injured by both frost and damp; next in order (we speak generally) the natural order *Geraniacæ*, and all similar soft-wooded plants. The hard-wooded plants of New Holland, and the *Ericas* from the Cape, may be the last to be removed to their winter abode. When the process of taking them in commences, the plants should be individually examined; all that require it, should be supported in a proper manner, and all superfluous or ill-placed branches taken off, as well as all dead leaves and twigs; the pots should be thoroughly cleaned, washed, if necessary, and the surface of the mould in the pots stirred up, if at all hard. When they are all thus prepared, they should be then carried into the green-house, and as yet set very thinly on the stages, so that they may not shade each other, nor impede the free circulation of air. For a few days after their removal into the house, they should be regularly looked over, and watered once, or if necessary,

twice a-day, as they will require more water at this period than at any other, and a want of it at this time would be of the most injurious consequences to them.

POTTING OFF SEEDLING HEATHS.

We referred the reader in April to the subject of potting off seedling heaths, which, if no accident have befallen them, will be now in a good state for being put into their second state of culture. According to the instructions then laid down, the smallest pots should be used; and being perfectly well drained, the mould should be prepared for them, of the same kind as recommended for the culture of this family. As the young plants will yet have made but few and small roots, the mould should be well prepared for them; and, independently of being well broken with a spade, should be put through a moderately fine sieve, but not so fine as that used for preparing the seed-pots. After this potting, sifting the mould should never be attempted, for reasons which have been already given.

In taking the young plants out of the seed-pots, great care is necessary, that they be not injured; each plant should be put into a separate pot, and when the whole seed-pot is thus potted off, the young plants should be carefully watered with a very fine rose watering-pot, and placed in the shade for a day or two. After which, they should be placed upon shelves in the heathery, as near to the glass as possible, that they may enjoy plenty of light and air. Here they should be shaded for a few days, if the sun be powerful, and gradually hardened to it, till at last they can bear it without flagging, that is, drooping their leaves, which, in the culture of this plant, should be carefully avoided. In this state they are to stand till spring, and to be regularly watered, and kept free of damp, which is their greatest enemy. In houses that are not in good repair, a careful examination must be made to remove such pots as are under drips from the roof, which, if not attended to, would soon destroy the plants. These minutiae being attended to, they will require no farther notice till they are repotted in the ensuing spring, at the same time with the other plants.

OCTOBER.

WATERING AND VENTILATION.

The instructions which were given last month on the subject of ventilation and watering, are applicable to this month also, observing that both be administered with less profusion as the weather becomes colder. Thus far we may add, that the conservatory should be ventilated to its fullest extent only for a few hours in the finest days, carefully shutting up both sashes and ventilators every afternoon. With respect to greenhouse plants, they should be abundantly supplied with air on all favorable occasions; a deficiency of this element now would make most of them lose their leaves, and others damp off, sometimes the less hardy by the surface of the pots. They will require to be regularly looked over to supply them with water; but although the supply be daily, it should be given in a much less quantity than formerly. All dead leaves and branches that indicate a disposition to damp, should be removed; the surfaces of the pots kept clean, and as little water spilt unnecessarily in the house in damp days as possible. During this month the plants should be frequently turned about to the sun, and those which are delicate should be fully exposed, and not crowded under the shade of larger or hardier plants.

REMOVING THE REMAINDER OF THE GREEN-HOUSE PLANTS
INTO THE HOUSE.

By the first or second week in this month, the remainder of the green-house plants which were not taken in last month, should now be taken in. The observations offered last month under this head, should be attended to. In addition, we may however add, that when there is an appearance of worms in the pots, the plants should be carefully turned out, without breaking the balls, and the worms picked out, which will be

readily done, as they are for the most part found round the outside of the ball. These troublesome creatures can, however, be expelled (as stated in the *Flower Garden*) by watering the mould in the pots with water into which unslacked lime has been put. The caustic property of the lime will bring them up to the surface, when they may be picked up and carried away.

All plants that are infested with insects, should be completely cleaned before they be taken into the house; but at this season, this will not often be the case if the plants have been properly managed during the summer, as their rapid and free growth will in most cases be a preventive. The scaly insects will, even on very healthy plants, particularly coriaceous-leaved ones, be met with, and they should be washed off with a sponge, or soft brush, and soap and water. Those plants which are sickly or ill-grown should be thrown away, if duplicates of them have been propagated; it is the height of folly to keep diseased or mis-shapen plants in any collection when they are so easily propagated. When a regular system of propagating is annually adopted, and all good cultivators follow that practice, a certain part of the stock will of necessity be to be disposed of, as in the end, no houses of reasonable dimensions would otherwise hold them; and as this is the case, all that are worn out, ill grown, or sickly, should be selected and destroyed. Almost all green-house plants flower and look best when young, and the cultivator who does not renew his plants to a considerable extent annually, will never gain much credit by his collection.

ARRANGING PLANTS IN GREEN-HOUSES.

The instructions which were given on the subject of arranging green-house plants, when set out in the early part of the summer, are to be applied here also; but as the whole collection is generally contained in one or two houses at most, a more general effect may be produced. As the season of the tender annuals, which has occupied the stages of the green-houses for the last three months, will be now past, they of

course are to be thrown away, and the whole space dedicated to the plants to which the house may be said to belong.

In arranging plants in houses, the first object in view with the cultivator is, and justly ought to be, assigning to each plant, or species of plants, situations or stations in it suitable to their respective natures, as some prefer the sun and some the shade. By far the greater part, however, prefer the former, and in any kind of arrangement they should occupy situations as much exposed to its influence as possible. Some families may be termed unsociable, that is, refusing to prosper when mixed with others different from themselves in some particulars, although often natives of the same latitude. Such has long been known to be the case with that numerous and delightful family *Erica*, or heaths; and hence probably the idea first originated of appropriating separate houses for them. Although it must be admitted that such an arrangement is to be preferred, it is not always that circumstances will admit of it; and in order that such a delightful genus of plants should not be discarded from collections on a small scale, we would recommend the idea of grouping them by themselves, either at one end of the green-house, if the number cultivated be considerable enough, or if only few in number, that they occupy a part of the front trellis or shelves nearest the glass, and always in the coldest end of the house. Almost all plants with small heath-like leaves succeed best when fully exposed to the sun and light; and as a rule, from which there can be few exceptions, all young plants, propagated during summer, should also be accommodated upon the shelves or trellises, either towards the front or ends of the house, so that they may be not only exposed to the light, but also under the more immediate eye of the cultivator.

That numerous division of plants, denominated succulent, and which contains many genera of green-house plants, can dispense with the genial rays of sun-shine for a greater length of time, without much inconvenience, than many others, if we except that interesting, although too generally neglected, division of plants, denominated *Ferns*; these may occupy back shelves: the former where there is no damp or likelihood of

having water spilt upon them; the latter where they may be equally shaded, but in a more humid place. Thick leathery-leaved plants, such as oranges, and many others, will succeed in a tolerable degree of shade; and if large, may occupy the back parts of the green-house, where plants of more delicate constitutions would not prosper so well. Delicate-leaved plants in general like much light and sunshine, and therefore should occupy situations more in front; and the young stock of the present year's propagation should also occupy light and airy situations on shelves near the glass, and where they may be more readily got at, for the purpose of watering them, or performing any other necessary operations.

Green-house bulbous plants are peculiarly interesting, although by no means so universally cultivated in private collections as they merit. Those who have visited Mr. Colvil's splendid collection of these plants, can only form an idea of the beauty of them; and if it were generally known that their culture is so simple, few, we believe, would hesitate to add them to their collections. As to their situation in the green-house, it is only while in flower that they intrude themselves upon us, as requiring any room or even much attention; and then they amply repay us for any care or attention that they may for a time require, by the splendor and diversification of their rich and elegant bloom. The accompanying figure of the *Amaryllis psittacina* was drawn from a plant in flower in that splendid collection at a time when upwards of five hundred others were in bloom. During a part of the year, they, like most other bulbs, become dormant; and while in that state they may be taken out of the pots altogether, and the mould shaken from their roots and kept in boxes well ventilated, in a temperature rather above that marked temperate on Fahrenheit's scale. In this state they may remain until they be showing flower, when, as they appear in that state, they should be potted, and introduced into the green-house; and when done flowering, and the leaves fully formed, and beginning to decay, they may then be again removed.

COLD PIT DEPARTMENT.

Amongst nurserymen, and in extensive botanical gardens, these structures are very common, and are found to be very useful appendages for wintering many half-hardy and often many green-house plants. These should now be refreshed with fresh coal-ashes, gravel, or other similar material, upon their bottoms or floors, upon which the plants are to be placed. A very considerable portion of the Cape heaths, and not a few of the New-Holland plants may be placed in them, which, with a little care in covering up, and regular management, will survive the winter better than plants in an ill-kept green-house.

And in such pits may with propriety be kept all or most of the delicate varieties of China roses, of which the yellow China, as our figure represents, is amongst the most interesting; and the sweet-scented China, which is too delicate to prosper well in most situations, could be brought to the greatest perfection if kept in pits of this kind during the winter months.

To those whose circumstances do not admit of having green-houses, commodious accommodation could be easily and at little expense obtained by the use of pits, which, if kept water-tight, and the frost excluded, which can always be done by covering sufficiently, tolerable collections of exotic plants might then be expected to be met with, not only in our suburban gardens, but in the gardens of every private individual throughout the kingdom, whose taste or fancy might lead him to their cultivation.

NOVEMBER.

VENTILATION AND WATERING.

Abundance of fresh air should be daily admitted to the plants in the green-house when the weather is not too frosty and cold, for much of the success of getting them well through the approaching winter depends upon a regular attention to this hint. The conservatory also demands particular attention, as far as regards this process, both to keep the plants in a healthy growing state, and to preserve them from damping. Should damp at any time gain a-head in either department, a slight fire may be made on a fine day; and when the flues begin to become warm, the ventilators, and even part of the washes, should be opened, to permit the steam which is generated to pass freely off.

Plants in pots will require to be daily examined, that none become too dry; however, the quantity of water given must be limited, as it is now better that the plants appear to be dry than otherwise. In watering, as little should be spilt on the leaves or other parts of the plants, and also on the floor of the house, as possible, as that is certain to produce damps, which at this early part of the winter are very detrimental to them, much more so than towards the spring. The watering should be always henceforth performed as early in the day as possible, that the sun may dry up the superfluous moisture before the house be shut up for the night.

TEMPERATURE.

It is seldom that fire-heat is required in either of these departments till towards the middle of the month; however, the cultivator must be on his guard now every night, for there is little dependance to be placed on the weather after this time. A slight degree of frost now before the plants have done growing, will do more mischief than a greater degree of it at a more advanced period.

POTTING BULBS FOR FORCING.

Either the latter end of last month, or the beginning of this, is a good time to pot bulbous roots for forcing, to decorate the drawing-room, the green-house, or the conservatory, early in spring, before other plants come into flower. The kinds most generally in use for this purpose, are hyacinths, jonquils, Persian Iris, narcissus, tulips, and crocuses; and, in addition to these, when the taste of the cultivator leads him that way, may be added most of the bulbs indigenous to the Cape, such as amaryllis, oxalis, isia, gladiolus, &c. Either of these may now be potted, in pots of sizes differing according to the size of the bulbs; although these plants, particularly the larger growing kinds, will produce their flowers in much greater perfection when potted singly, yet it is very usual to plant more than one, nay often many roots into one pot, particularly of the smaller-sized kinds. The mould most proper for them is like that recommended for all other bulbs, light and rich; indeed, it cannot be said to partake too much of either of these properties. Still it must be borne in mind, that unprepared dung, that is, such as has not undergone complete decomposition, should never be used. A compound of fresh maiden yellow loam, pure sand, and completely rotten dung, at least twelve or eighteen months old, is to be preferred, and a smaller portion of vegetable mould of decayed trees or leaves may be advantageously added. The proportions of each must be regulated by the kinds of bulbs and by the texture of the loam, whether strong or friable; if strong, a greater proportion of each of the other parts must be added, particularly that of sand, but if friable and light, a less quantity of either will suffice, particularly of sand, which in all cases is added to reduce stronger soils to a proper texture. In planting the bulbs, they should not be put in too deep, but a part of their upper surface or crown should be left uncovered. When the whole are planted, they should be buried under some rotten tan, saw-dust, or dry light mould, in a dry situation. We allude here to the hardier kinds, such as are in most common cultivation. In this situation they are to remain until taken up to be placed in the green-house or forcing-pit,

which latter situation is the most proper, although less common. Those denominated Cape bulbs are, however, not treated in this manner, but there can be no doubt that, to a certain extent, a similar treatment would be beneficial; for, being excluded from the action of air, a disposition is naturally brought on to push out roots; and these being once produced in abundance, there can be little doubt that the bloom will be proportionably stronger. At present, cultivators content themselves by merely placing them upon shelves or other convenient parts of the green-house, and some few, with greater propriety, place them in cold pits, where they are defended both from too much wet and frost; here they remain until coming into flower, when the pots are cleaned and the plants carried into the green-house or conservatory.

GENERAL MANAGEMENT OF THE GREEN-HOUSE AND CONSERVATORY.

All the dangers of winter have now to be guarded against, such as excess of dampness, coldness, and stagnation of air; all of which require a daily examination. Dampness is to be expelled or prevented by a proper attention to the temperature and ventilation of the house. In watering now, care should be taken not to spill any on the leaves or floor of the house, particularly in damp or rainy weather; and also that no plant be too much supplied with it, particularly if in a sickly or weak state. Watering over head should only be resorted to upon extraordinary occasions, in the country, where the air is pure, but in and round large cities, and in confined atmospheres, it cannot be well dispensed with. Therefore, when that process is applied, a clear dry day should be chosen, and ventilation freely attended to; should this not dry up the superabundant moisture completely, then the assistance of the furnace and flues must be called in to give their aid. All green-house plants should be regularly gone over, and all dead leaves picked off; the surface of the mould in the pots cleaned or stirred up. Such plants as require it should be supported in a neat and natural manner, and often turned round, so that all their sides may derive an equal benefit from

the sun. This last simple process is too little attended to; hence the many deformed and mis-shapen plants for which most green-houses are so very conspicuous. Cultivators often, for want of attending to this, allow many plants to become one-sided, as it is practically termed, that is, having one side only fit to be seen, and the other, which has been shaded for some months, unfit for being exposed to sight. This once being the case, they go on increasing in deformity, until at last they become either a disgrace to any ordinary collection, or die altogether. This would never be the case if attention were paid to this point, occasionally turning them round, allowing every side of the plant to enjoy a share of sun-shine, particularly during the dark months of winter. The plants in the conservatory should be also regularly attended to, all dead leaves should be picked off, and all decaying parts of flowers. The surface of the borders should be frequently stirred up, and attention paid to tying up and supporting such plants as require it. The climbing or creeping plants should be somewhat pruned in, that is, all straggling and ill-placed shoots either removed or shortened, both that the shade which they create may not injure those under them, as well as to make room for a supply of young wood for the flowers of next season. All annual or temporary plants, which may have been introduced for their flowers during summer, should now be taken out, that the house may not be crowded with plants not its own, and that room may be made for such as belong exclusively to that department.

DECEMBER.

GENERAL MANAGEMENT OF THE GREEN-HOUSE AND
CONSERVATORY.

This is the most gloomy month in the year. All the vegetable part of Nature is, as it were, in a state of rest or sleep. Vegetables, if it may be so expressed, require a season of rest to fit them for their various and important duties, and during this season of inactivity, the roots are acquiring fresh strength, that they may, when excited by proper stimuli, perform their various functions in perfection and with vigour. Some plants may, however, be kept in a growing state during the whole of their lives; but this is only the case with such as are of very limited duration, such as annuals, some biennials, and some perennials: the two latter when artificially excited or stimulated. Some plants naturally require a long secession from the offices of life, and remain dormant many months, some more than one year; and circumstances sometimes occur of the roots of plants, when disturbed, continuing inactive for many years. The seeds of many plants, also, retain their vegetative properties although buried in the earth for half a century.

In regard to the plants which occupy the green-house and conservatory, most of them at this season will be almost inactive, they therefore require little stimulus, particularly that of heat and water; the less of either of them that is applied, during this month, the better we have always found the plants to push forth in the spring. Some few, indeed, are even during this month naturally in flower, but these can only be considered as not sufficiently weaned from their native habits; and some others will produce their flowers now that have from some cause, either intentionally or accidentally, met with a check, or been altered in their economy during the preceding summer or autumn. It may not be unworthy of notice here, as we believe the circumstance is not generally known, at least we have never heard it advanced, nor have we met with any ac-

count of it in any horticultural work that has come under our observation; viz. that several rare plants that do not perfect their seeds with us from the flowers produced in summer, do so from flowers produced during the winter. It is not here the place, probably, to endeavour to account philosophically for such a cause, which would require more room in the elucidation than we can spare, in a work professedly plain and practical, but that such is the fact we have more than once had an opportunity of witnessing. This is the case with such plants in particular as abound with that honey-like matter, poetically called nectar, from its being the fancied drink of the gods. A too abundant supply of this liquid, which is supposed the primitive food of seeds, may probably be the cause of the sterility of those plants, which abound with it during summer, when it is naturally more abundant in them. During autumn and winter it is in much less quantity in flowers, and in this manner may be just sufficient, and no more, for that important office for which Nature has designed it.

The green-house and conservatory will now be the favorite lounge of the proprietor who indulges in the beauties of Flora, they should therefore be kept in the greatest possible order and neatness. Should insects appear upon the stems or leaves of the plants, they should be suppressed by some of the numerous rules laid down in various parts of this work, or by means probably more economical, convenient, and complete, which the cultivator may either devise or adopt.

AN ENUMERATION
OF THE PRINCIPAL GENERA OF
GREEN-HOUSE AND CONSERVATORY PLANTS;
WITH THE SOIL EACH GENUS THRIVES IN.
INCLUDING THE MODE OF PROPAGATION, WHETHER FROM
SEEDS, ROOTS, CUTTINGS, &c. &c.

Previously to entering upon the enumeration of the genera; the following observations may not be deemed irrelevant:—

Peat, loam, and sand, are the three simples of nature which are made use of by cultivators, and the composts which are formed of them in different proportions may be said to suit all plants; those that are parasitic, of course, being excepted. To these are added occasionally vegetable mould of decayed tree leaves, and in some cases dung, which has long undergone the process of fermentation, and become perfectly decomposed. Lime-rubbish, pounded brick-bats, and gravel, are used in the cultivation of some succulent plants, which require for the most part little nourishment from the soil, and chiefly exist on the humidity of the atmosphere.

Peat, properly so called, is decomposed vegetable matter, composed of, in some cases, entirely of decayed *Sphagnum*, and other mosses; in others, of decayed wood, mixed with herbaceous remains, and most generally of an heterogeneous accumulation of many vegetables. This sort of peat is not so much used, nor is it so much prized by cultivators, although for some plants it is very useful.

Sandy peat, in its natural state, is most esteemed, and is to be found on the surface of most heaths, and is composed of decayed vegetable matter, of a black colour, and pure white shining sand, in considerable abundance.

Sandy peat may be formed by adding pure white sand to the peat of entire vegetable remains, which is entirely without

sand naturally; and as a substitute, vegetable-mould of decayed tree-leaves and sand may be used.

Bog-mould is generally confounded with the above kinds of peat, but is more correctly used when we express any thing relating to peat of vegetable remains, or such as is used for fuel; but even in such mould many plants flourish.

Loam is of various kinds, differing in colour, texture, &c.; but that which is used by cultivators simply is of two sorts, namely, strong loam and light loam. The former is less used than the latter, and nearly approaches to clay, being of a yellow colour, and feeling greasy to the touch, but breaking freely into pieces when half dried. Such loam as becomes hard when dried, is not so useful to the cultivator, but it may be partially corrected by the addition of sharp sand.

Light loam is generally to be preferred, and that which is obtained from the surface of sheep walks or downs, which have never been under cultivation, is the best, and is denominated virgin-loam. Its colour is in general yellow or hazel-colored, although sometimes black. Such loam contains only a small portion of sand, which may be detected by washing and examining the sediment. It generally contains a considerable portion of fibrous matter, and the greater quantity that it does contain, the better. It is seldom good for immediate use, if taken deeper than six or ten inches below the surface, although some instances occur when it has been found good at a greater depth. It, however, should be dug up, and exposed to the action of the atmosphere some time previously to its being used.

In the following short directions for the propagation of green-house and conservatory plants, notice is repeatedly taken of the following composts. These are in general compounded in nearly the following proportions:—

SANDY LOAM.—Three-parts loam to one of sand.

SANDY PEAT.—Often found naturally upon the surface of heaths, and contains a large portion of pure white shining sand. When artificially compounded, three-parts of peat to one of pure sand.

RICH SANDY LOAM.—One-third or fourth very rotten dung added to sandy loam.

RICH SANDY SOIL.—Same as above.

SANDY LOAM AND PEAT.—Half sandy loam and half peat.

LOAM AND PEAT.—Half light loam and half peat.

PEAT AND LOAM.—Same as above. When loam precedes the word peat it is understood that the genus will prosper in a greater proportion of it, and *vice versa*.

LOAM AND PEAT AND ROTTEN WOOD.—Half loam, half peat, and a small portion of rotten chips of wood added.

LOAM AND ROTTEN DUNG.—Three parts loam, and one of rotten dung.

RICH LOAMY SOIL.—Either pure rich maiden loam, or loam enriched with dung, vegetable-mould, &c.

LOAM AND LIME-RUBBISH.—Maiden loam and lime-rubbish mixed.

VERY RICH LIGHT MOULD.—Chiefly decayed dung and vegetable-mould.

In regard to propagating by cuttings, fine white sand is generally used, into which the cutting is inserted; below which, after the pot is sufficiently drained, that sort of soil is placed in which the genus is found to thrive. There are few plants that are capable of reproduction by this means, that will root freely in sand; and many of the freely-growing sorts will strike in the mould recommended for the genus.

The shallower that all cuttings are put in the pots, the sooner and better they will root. The sand must never be allowed to become too dry, for in such a case much injury might be done before the cultivator might observe it. Neither should they be kept too moist, for fear of damp, which should be guarded against by frequent observation, and by once or twice a-day wiping the glasses with which they are covered. The sooner that cuttings are potted off, after they are rooted, the better; and if carefully shaded, and not put into too large pots, the better they will thrive. The sand should be completely removed from the roots of the cuttings previously to potting off, for it is very injurious to most plants, particularly those that are of delicate growth. This circumstance does not appear to be generally known, at least if it be, it is not always acted upon, and to this may be attributed many of the failures which usually attend the potting off of cuttings.

Plants originated from cuttings taken from plants in a flowering state, have an advantage over seedling-plants, as they come into bloom much sooner, and often while quite small; thus geraniums, and many other plants, propagated from the terminal shoots that would produce flowers, are found to root and come into bloom when only a few inches high, and often in pots of not more than three inches diameter. Seedling-plants, although they in general grow much more luxuriantly, seldom produce their flowers till they have attained nearly their full size. Plants originated by laying, also bloom soon, but can seldom be trained, excepting in the case of creeping or climbing-plants, to any thing like a handsome head. But laying is the only means by which some plants can be propagated with facility, and hence it becomes necessary.

Plants originated by budding, grafting, or inarching, come into bloom soon after the operation is completed; but unless the operation be performed with judgment, the part of union long remains a blemish. In regard to budding or inarching those species which are difficult to be otherwise propagated, it should be borne in mind, that almost all plants capable of being increased by this means, will take upon one or other of its own family that may either be more plentiful or less valuable; and some plants will take upon others not directly belonging to their own genus, but nearly related to it in natural affinity.

The modes of propagation pointed out to us by Nature, are seven: first, universally by seeds; secondly, partially by offsets, slips, germes, runners, suckers, and bulbs, and by these means all plants are naturally multiplied. But so many circumstances combine, in the culture of many species, that renders it impossible for the best cultivators to increase their stock by these means. Artificial methods have, therefore, been invented, and these may be enumerated under five heads, namely, cuttings, budding, grafting, of which there are many varieties, (see *Fruit Garden*,) inarching, and laying. By some of these means, almost all plants cultivated in our gardens may be increased or perpetuated.

In propagating by natural means, we may observe, that, as seeds are the first, and by far the most general of all the na-

tural modes of propagation, great care should be taken by the cultivator to save such as ripen in his own collection. When the object is to perpetuate the same species or variety pure and unadulterated, which is often the case, particularly with the florist, every precaution should be taken to prevent them being impregnated with the fertilizing dust of any other species to which it may be allied; but when the object is to increase the number of varieties, a considerable degree of judgment is required on the part of the cultivator; first, that choice be made of two flowers, each partaking of certain properties, which, if combined in one, would make a hybrid, possessing the wished-for merits. In such cases, nothing should be left to chance: the male parts of the one may be carefully cut out with a pair of very sharp-pointed scissars just before the dust is ripe, and the dust of the other plant brought into close contact with the female part of the flower operated on. A careful observation is necessary to perform this important office at that exact period when the flowers of both plants are in a proper state; if this be not attended to, there is little chance of success. Many splendid hybrid bulbs have been thus produced by Messrs. Sweet, Colvil, and others, one of which, *Amaryllis Psittacina* var., we have adopted for our plate, and some beautiful *Passifloras*, by Mr. Milne. Fruits by Mr. Knight; and florist's flowers by almost every one eminent in that fancy

Offsets, may be termed young radical bulbs, which, when separated from the parent-roots produce plants exactly similar to them, and never sport into varieties or monstrosities like the progeny of seeds, except from accidental causes.

Slips, are produced upon almost all herbaceous plants, and some shrubs, and issue from the plants near the surface of the ground, as in the case of *Auricula*, and similar plants. The proper period of their growth, when they are fit to be taken off, is when the part of the slip next the ground attains a somewhat firm texture, or what is technically called ripe. The operation of propagating by this means, consists simply of separating the slips from the parent-plant, by pulling or twisting them off, which is no difficult matter; and as they generally bring off a heel or piece of the old wood or stem of the plant with them, to which sometimes are appended roots, or

the embryo of them, they are then fit to pot off, or plant under a hand-glass, when they require to be shaded for a few days, and watered, and when sufficiently rooted planted out, where they are to remain.

Germes, or bulbs, are produced by the side of the parent bulbs, although sometimes above them, and are denominated radical or root-germes, to distinguish them from such as are produced on the stems of some plants, such as some species of *Allium*, *Lillium*, &c.; and such are denominated cauline, or stem-germes, or bulbs. *Germes*, or bulbs, whether radical or cauline, should be immediately planted after being removed from the parent-plant, as they are generally small, and very apt to be dried up, and soon lose their living principle if left long exposed to the air.

Runners occur in many hardy plants, but not very frequently with those which are inhabitants of our green-houses or conservatories. They are young plants, which proceed from long cord or thread-like appendages, which *issue* from many herbaceous plants, and generally strike root wherever they touch a favorable surface. When their roots are sufficiently formed, they may be taken entirely from the parent-plant, and treated as other young plants.

Suckers are of two kinds, that is, proceeding from the roots and also from the stem. The former have been defined to be merely runners under ground; some extending to a considerable distance from the original, and others rising quite close to it. As these in general are rooted under ground, all that is required is to take them up with a portion of root attached to them, and dispose of them as if perfectly-formed plants. The latter sort seldom have any roots attached to them while they remain on the parent, as is exemplified in the case of the pineapple, the majority of succulent plants, &c. In propagating by them, it is necessary to remove them when they become partially hard at the bottom, after which, they should be laid by to dry for a few days, and afterwards potted, when they will, if kept moderately dry, make roots in a short time.

In regard to the various methods of propagation, which may be denominated artificial, we have, in their respective places throughout this work, had occasion to notice them, particularly in the Fruit Garden (*which see*).

Soil.	Mode of Propagation.
ACACIA Loam and peat	{ Cuttings and seeds, some species, however, from cuttings of the roots.
Acæna Loam and peat	Cuttings root freely.
Achillea Loam and peat	Cuttings root freely.
Achyranthes Peat and loam	Cuttings, when the wood is young.
Acrostichum { Loam and peat, or rotten wood	{ Dividing the roots, and by seed.
Actinocarpus Loam and peat	Seeds, cultivated by being immersed in water.
Adenandria Sandy loam or peat	{ Cuttings of the tips of the young wood, in fine sand, and cold frame.
Adiantum { Rotten wood, or sandy loam & peat	{ Dividing the root, or by seed, like <i>Acrostichum</i>
Agapanthus Loam and rotten dung	Dividing the roots, and sometimes from seeds.
Agathosma Sandy peat	Cuttings of the young wood.
Agave Rich loamy soil	Suckers from the roots.
Ageratum Light rich soil	Cuttings root freely.
Aitonia Sandy loam and peat	Cuttings of the young wood.
Aizoon Loam and lime rubbish	Cuttings root freely.
Albuca Rich light loam	By suckers from the old bulb.
Allantodia Loam and peat	Dividing the root, or by seed.
Aloe Light mould & lime rub.	Suckers, which freely rise from the roots or stem.
Alonsoa Light rich soil	Readily by cuttings and seeds.
Aloysia Light rich soil	Cuttings of the young wood.
Alstræmeria Very rich light mould	{ Seeds vegetate freely, if sown as soon as ripe and by dividing the roots.
Alternanthera Light rich soil	Readily increased by cuttings.
Amaryllis Rich loam	By offsets from the bulbs.
Amellus Loam and peat	Readily increased by cuttings.
Anabasis Light loam	Cuttings of the young wood strike pretty freely.
Anacampseros Sandy soil	By cuttings, or by leaves of the plant.
Anagallis Light sandy soil	{ Cuttings of the plant strike readily during the spring and summer months.
Anagyris Peat and loam	By cuttings.
Andersonia Peat and loam	{ Cuttings of the young wood strike with care in March and April.
Andryala Peat and loam	Cuttings root readily.
Anigozanthus Peat and loam	By dividing at the root.
Anthericum Sandy loam and peat	Generally from seed, or by cuttings.
Anthocercis Loam and peat	Cuttings root freely.
Antholyza Sandy loam	By seeds and offsets.
Anthospermum Loam and peat	Cuttings strike freely.
Anthyllis Loam and peat	{ Many of the species produce perfect seeds, which grow, and the others are propagated by cuttings.
Antirrhinum Loam and peat	By cuttings.
Aotus Peat and loam	Cuttings of the young shoots strike pretty freely.

Soil.	Mode of Propagation.
AponogetonLoam and peat	} By offsets from the bulbs, or by seeds; plant while growing should be placed in a pond or cistern of water, and should be kept dry all winter.
AraucariaPeat and loam	
ArbutusRich sandy loam	} By seeds, when they can be imported; sometimes by cuttings; but the latter method seldom produces good plants.
ArctopusLoam and peat	
ArctothecaLoam and peat	} By budding or inarching, or the common Arbutus; sometimes by seeds and layers.
ArctotisPeat and loam	
ArdisiaLoam and peat	} By cuttings of the young wood, and when seeds are obtained, by that process.
ArduinaPeat and loam	
ArenariaPeat and loam	} Cuttings strike root, but not readily.
ArethusaRich loam and peat	
AristeaPeat and loam	} By seeds, and also by cuttings of the plant.
AristolochiaLoam and peat	
ArtemisiaLoam and peat	} By seeds, which should be sown as soon as ripe.
ArthropodiumSandy loam and peat	
AsclepiasSandy peat and loam	} Readily propagated by dividing them at the root, as well as by seeds.
AscyrumPeat and loam	
AspalathusLoam and peat	} Easily propagated by cuttings.
AsparagusLoam and peat	
AspidiumPeat and veget. mould	} Multiplied by seed, or by dividing at the root.
AspleniumPeat and veget. mould	
AsterPeat and loam	} By seeds and cuttings.
AstrolomaSandy loam and peat	
AthanasiaPeat and loam	} Cuttings of the young wood strike pretty freely.
AtraphaxisLoam and peat	
AtriplexLoam and peat	} By cuttings.
AtropaLoam and peat	
AulaxSandy loam	} Not increased readily but by seeds which are imported.
AzaliaSandy peat	
BabianaSandy loam and peat	} Cuttings of the young wood strike pretty well in a bottom-heat.
BaccharisPeat and loam	
BæckiaPeat and loam	} Rapidly by offsets from the roots, or by seeds.
BalsamitaPeat and loam	
BanksiaPeat and loam	} Cuttings of the young wood strike freely.
BartholinaSandy loam and peat	
	} Freely by cuttings.
	} By cuttings, but the best plants are from seeds imported from New-Holland.
	} Requires little water while in an inactive state.

Soil.	Mode of Propagation.
Bauera	Peat and loam Cuttings of the half-ripened wood strike freely.
Beaufortia	Peat and loam By cuttings of the half-ripened wood.
Bejaria	Sandy peat By cuttings of the young wood.
Berckheya	Peat and loam Readily increased by cuttings.
Bignonia	Peat and loam { Cuttings of the young wood strike in heat; the old wood strike by layers: the former is the best method.
Billardiera	Peat and loam By seeds, and also by cuttings.
Blæria	Sandy peat By cuttings of the young wood.
Blandfordia	Sandy loam and peat By seeds or suckers from the roots.
Blechnum	Peat and veget. mould By seed, and dividing the roots.
Bletia	Loam and peat By dividing at the roots.
Bœhmeria	Loam and peat Cuttings root freely.
Borbonia	Peat and loam { Cuttings of the young wood strike readily, if carefully shaded.
Boronia	Sandy peat By cuttings.
Bosea	Loam and peat Cuttings of the ripened wood strike pretty freely.
Bossiaea	Sandy peat Cuttings of the half-ripened wood strike freely.
Bouvardia	Peat and loam Readily by cuttings, and also by pieces of the roots.
Brabejum	Sandy loam and peat By ripened cuttings of the wood.
Brachylæna	Peat and loam Cuttings of the ripened wood strike freely.
Brachysema	Sandy peat By layers, and sometimes by cuttings.
Brunia	Peat and loam Freely by cuttings.
Brunsvigia	Rich light loam By offsets from the bulbs.
Bryonia	Sandy loam Cuttings of the young wood strike root readily.
Bubon	Peat and loam { Cuttings, taken off at a joint where the shoot is a little hard, strike freely.
Buddlea	Peat and loam By cuttings.
Bupthalmum	Peat and loam Readily by cuttings.
Bupleurum	Peat and loam By cuttings.
Bursaria	Peat and loam By cuttings of the young wood.
Burtonia	Sandy loam and peat { Cuttings of the young wood strike with care. It is altogether a delicate genus.
Bystropogon	Peat and loam Readily by cuttings.
Cacalia	Poor sandy soil By cuttings, which should be kept dry till rooted.
Cactus	Poor sandy soil By cuttings, which should be kept dry till rooted.
Cæsia	Loam and peat By seeds, or dividing at the roots.
Calceolaria	Loam and peat By seeds and by cuttings.
Calendula	Peat and loam Readily by cuttings.
Caleya	Sandy loam and peat By seeds, and by dividing the roots.
Calla	Peat and loam By offsets of the roots.
Callicoma	Peat and loam Cuttings of the ripened wood strike freely.
Callistachys	Loam and peat { From seeds, which often ripen, and also from cuttings.
Callistemon	Peat and loam Readily by seeds.
Calodendrum	Loam and peat By cuttings of the ripened wood.
Calostemma	Peat and loam { By seeds which are produced on large plants, and also by offset bulbs.

Soil.	Mode of Propagation.
Calothamnus .. Peat and loam	By cuttings, which root freely if kept from damp.
Calytrix Sandy loam and peat ..	By cuttings, but not very readily.
Camellia Sandy loam and peat ..	{ By seeds, cuttings, and by grafting and inarch- ing on stocks of their own species.
Camphorosma . Peat and loam	By cuttings.
Camphylia Sandy peat and loam ..	By cuttings taken off at a joint.
Canarina Light sandy loam	By dividing the roots, or by cuttings of the stem.
Capraria Loam and peat	By cuttings.
Carthamus Loam and peat	By cuttings.
Cassia Peat and loam	By seeds or cuttings.
Cassine Peat and loam	Cuttings of the ripened wood strike freely.
Cassuarina Peat and loam	By cuttings, and often by imported seeds.
Ceanothus Sandy loam and peat ..	By cuttings.
Celastrus Peat and loam	By cuttings.
Centaurea Peat and loam	Cuttings strike freely.
Cestrum Loam and peat	By cuttings.
Cheilanthus Peat and veget. mould ..	By seeds, and by dividing the roots.
Cheiranthus Peat and loam	Cuttings strike readily.
Chenolea Peat and loam	By cuttings.
Chimonanthus . Peat and loam	{ By layers in spring; by cuttings of the young wood in summer; but in greater quantity from seeds imported.
Chironia Sandy peat	Cuttings root freely.
Chorizema Peat and light loam ..	By cuttings, but much better from seeds.
Chrysan- } hemum. } Peat and loam	{ Cuttings root freely, and some species by dividing the roots.
Chrysocoma Peat and loam	By cuttings.
Cineraria Loam and peat	By cuttings.
Cissus Peat and loam	Strike by cuttings in bottom-heat.
Cistus Peat and loam	{ Most of the species propagate freely by cuttings, and all of them from seeds, which ripen abundantly.
Citrus Rich soil	By seeds, cuttings, inarching, and grafting.
Clerodendrum . Loam and peat	By cuttings.
Clethera Loam and peat	By cuttings, and also by seeds, which ripen often.
Cliffortia Peat and loam	By cuttings.
Clnytia Peat and loam	Cuttings strike freely.
Cobæa Rich soil	Generally by seeds, and sometimes by cuttings.
Commelina Peat and loam	By seeds, and dividing the roots.
Convolvulus Loam and peat	{ Some of the species by cuttings of the roots, others by seeds, and several by cuttings of the branches.
Coris Peat and loam	{ Should be perpetuated by seeds, but is often propagated by cuttings.
Coronilla Loam and peat	By cuttings freely.
Corrœa Peat and loam	{ Cuttings of the ripened wood strike pretty freely, particularly <i>C. alba</i> and <i>Veridiflora</i> , and are used as stocks, on which to inarch or graft the other rarer sorts.

Soil.	Mode of Propagation.
CrassulaSandy soil.	{ By cuttings, which should be partially dried before planting, as, being succulent, are apt to damp off.
Crotalaria.Peat and loam.	{ By seeds, which often ripen, and also by cuttings of the young wood.
Crowea.Peat and loam.	By cuttings.
CrucianellaLoam and peat.	Cuttings root freely.
Cryptospermum.Loam and peat.	Cuttings root freely.
CunoniaLoam and peat.	Ripened cuttings strike freely.
CupressusPeat and loam.	{ Imported seeds are to be preferred, but some of the species strike by cuttings.
CurtisiaLoam and peat	Cuttings of the ripened wood strike freely.
Cussonia.Peat and loam.	By cuttings.
CyanellaPeat and loam	By offsets, and also by seeds.
Cyclamen.Peat and loam.	{ This genus may be said to be propagated by seeds only, which ripen under good management.
Cyclopia.Loam and peat	Cuttings of the young wood strike pretty freely.
CynanchumLoam and peat	By cuttings.
CyrillaSandy loam and peat	{ The green-house species is not readily propagated by cuttings. When seeds can be obtained, they should be carefully sown.
Cyrtanthus.Light rich mould.	{ If care be taken to assist the impregnation of the flowers, seeds will be abundantly produced. They may be propagated also by offsets from the bulbs.
CytissusPeat and loam.	By seeds and cuttings.
Dias.Peat and loam.	{ By cuttings of the roots in a moderate temperature, and also by seeds.
Dampiera.Loam and peat.	Cuttings of the young wood strike freely.
DaphneLoamy rich soil.	{ By cuttings of the young wood, but with greater certainty from the ripened shoots, taken off at a joint, in a moderate heat.
Daviesia.Sandy loam and peat	{ Cuttings about half ripe strike pretty freely. <i>D. latifolia</i> is not easily propagated.
Dendrobium.Sandy peat	By dividing the roots.
Dianella.Sandy loam and peat	Readily by seeds, or by dividing the roots.
Dicksonia.Sandy loam and peat	By seeds, or by dividing the roots of old plants.
Digitalis.Peat and loam.	{ By cuttings, but more readily from seeds, which ripen frequently.
DilatrisPeat and light loam	{ By offsets, bulbs, and also by seeds, which should be sown in leaf-mould.
DillwyniaSandy peat	By cuttings, which require great care.
DimacriaLight loam & sandy peat.	By the little tubers of the roots.
DionæaLight peat & sphagnum.	{ This curious plant is often lost, more for want of a proper atmosphere than for want of proper soil. It should be kept damp, and partially shaded.

	Soil.	Mode of Propagation.
Diosma	Peat and loam	Cuttings of the young shoots root freely.
Disandria	Light loam	By cuttings freely.
Disperis	Loam and peat	By offsets.
Dodonæa	Loam and peat	{ By cuttings. By no means a showy genus, but much cultivated.
Dolichos	Loam and peat	From seeds and cuttings.
Doodia	Sandy peat and loam	Seeds vegetate freely, & the roots are often divided.
Doryanthes	Peat earth	{ By suckers which rise from the roots of old plants, but not very frequently. Imported roots or seeds are most to be depended on.
Dorycnium	Peat and loam	By seeds and cuttings.
Dracocephalum	Peat and loam	By cuttings.
Drimia	{ Sandy loam and de- cayed leaves }	By offsets from the bulbs, and from seeds.
Drosera	Peat and <i>sphagnum</i>	Few Foreign species are cultivated.
Dryandra	Peat and loam	By cuttings, and by imported seeds.
Echites	Sandy loam and peat	By cuttings, which root freely.
Echium	Peat and loam	{ Part of the genus by cuttings, and others by layers, but most by seeds.
Edwardsia	Peat and loam	By seeds, and also by cuttings.
Ekebergia	Loam and peat	{ By cuttings, which should not have their leaves shortened.
Elæocarpus	Peat and loam	{ Cuttings of the ripe wood strike pretty freely ; but as seeds are sometimes produced on large plants, they should be preferred.
Elegia	Sandy peat	By dividing the roots.
Elichrysum	Sandy peat	{ By cuttings of the young wood ; and some cul- tivators succeed by making cuttings of large pieces of the branches.
Empetrum	Sandy peat	Cuttings of the young wood strike freely.
Empleurum	Sandy peat	By cuttings of the young wood.
Entelea	Peat and loam	{ Seeds sometimes ripen, by which plants are ob- tained, as well as by cuttings of the half-ripe wood.
Epacris	Sandy peat	{ This beautiful genus is not very readily in- creased. Young wood is usually chosen for cuttings, which succeed best when planted in autumn or winter.
Erica	Sandy peat	{ Most of the species are propagated by cuttings of the young wood, and many of them ripen their seeds, which vegetate freely.
Eriocephalus	Peat and loam	By cuttings of the young wood.
Eriospermum	Loam and peat	By offsets from the roots, or by seeds.
Erodium	Rich loam	{ By cuttings of the shoots, by seeds, and by cut- tings of the roots.
Erythrina	{ Rich loam and rotten dung }	{ Readily by cuttings of the young shoots, when about half ripe.

Soil.	Mode of Propagation.
Grewia	Loam and peat By cuttings of the ripe wood.
Grielum	Sandy gravel Cuttings root readily.
Gunnera	Loam and peat { By dividing at the root, and cultivated as an aquatic plant.
Hæmanthus	Rich sandy loam By offsets from the roots.
Hæmodorum	Loam and peat By dividing the roots.
Hakea	Peat and loam { By cuttings of the ripe wood, put in, in winter or early in spring.
Halleria	Peat and loam By ripened cuttings.
Hallia	Loam and peat Cuttings of the young wood strike freely.
Hamiltonia	Loam and peat By cuttings of the ripened wood.
Hebenstretia	Peat and loam Cuttings of the young wood strike freely.
Hedysarum	Light rich soil Both by seeds and by cuttings of the young wood.
Helianthemum	Sandy loam and peat By seeds, & also by cuttings of the ripened shoots.
Heliophila	Sandy loam and peat { Principally by seeds, although cuttings of the young wood will strike root.
Heliotropium	Peat and loam By cuttings of the young wood.
Hermannia	Peat and loam By cuttings.
Herniaria	Light soil Cuttings of the young wood root freely.
Hibbertia	Sandy loam and peat By cuttings.
Hibiscus	Peat and loam By seeds, and by cuttings.
Hippia	Light soil By cuttings of the young wood.
Hippocrepis	Loam and peat Cuttings strike freely.
Hoarca	Light turfy soil { This genus is increased by small tubers from the roots, which should not be planted deep nor yet much watered.
Hopca	Loam and peat By cuttings.
Hovea	Peat and loam By cuttings, and sometimes from seeds.
Hovenia	Peat and loam Cuttings of the ripened wood strike freely.
Hoya	Rich light soil { By cuttings in a brisk heat. Every leaf taken close off the plant and potted will make a plant, if kept in a good heat.
Hudsonia	Peat soil { This plant is difficult either to keep or to in- crease. Cuttings sometimes will root.
Hydrangca	Rich soil { Most readily by cuttings either of the young o old wood.
Hypericum	Peat and loam Cuttings of the young wood strike freely.
Hypoxis	Sandy loam and peat By offsets, and by seeds.
Iberis	Rich light soil By cuttings freely.
Ilex	Rich soil By cuttings of the ripened wood.
Illicium	Loam and peat Cuttings of the young wood strike freely.
Indigofera	Peat and loam Cuttings of the young wood strike freely.
Ionidium	Loam and peat By cuttings.
Ipomæa	Rich light soil By cuttings in spring, in a bottom heat.
Iris	Peat and loam By the suckers which they throw up from their roots.
Isopogon	Peat and loam { Like most other plants allied to the genus <i>Pro- tea</i> , they are difficult to propagate. Seeds are sometimes imported by which a stock is procured, but cuttings seldom answer.

Soil.

Mode of Propagation.

<i>Ixia</i>	Peat and loam... ..	} By offsets from the bulbs; while in an inactive state should be kept dry.
<i>Ixodia</i>	Peat and loam	
<i>Jacksonia</i>	Peat and loam.....	By cuttings of both young and ripened wood.
<i>Jasminum</i> ...	Peat and loam.....	Cuttings root freely.
<i>Jenkinsonia</i> ..	Turfy loam and peat ..	By cuttings.
<i>Justicia</i>	Peat and loam	Cuttings root freely.
<i>Kerria</i>	Peat and loam.....	By cuttings and suckers from the roots.
<i>Kennedia</i>	Peat and loam.....	By seeds and cuttings.
<i>Kiggelaria</i> ...	Loam and peat.....	Cuttings of the ripened wood strike freely.
<i>Lachenalia</i>	Loam and peat	By offsets from the bulbs
<i>Lambertia</i> ...	Peat and loam	} Ripened cuttings, taken off at a joint before they begin to grow afresh, may be struck, but not without difficulty.
<i>Lanaria</i> ...	Sandy loam and peat ..	
<i>Lapcyrousia</i> ...	Light rich soil	Cultivated like <i>Ixia</i> , &c.
<i>Larochea</i>	Sandy loam	By cuttings.
<i>Lasiopetalum</i> ..	Peat and loam.....	Cuttings of the ripened wood strike freely.
<i>Lavendula</i> ...	Peat and loam.....	Cuttings of the young wood strike freely.
<i>Lavatera</i> ..	Peat and loam.....	} From seeds, which often ripen, and also by cuttings of the ripened wood.
<i>Laurus</i>	Peat and loam.....	
<i>Lebeckia</i>	Peat and loam	By cuttings of the young wood.
<i>Lechenaultia</i> ..	Peat and loam.....	By cuttings of the young wood.
<i>Leonotis</i>	Rich soil	Cuttings of the young wood strike freely.
<i>Leontice</i>	Peat and loam.....	By seeds, and by dividing the roots.
<i>Lepidium</i>	Light soil.....	By seeds or cuttings.
<i>Leptospermum</i>	Peat and loam.....	} By seeds and cuttings; the latter is preferred, as affording plants that will sooner come into flower.
<i>Leucadendron</i>	Light loam.....	
<i>Leucopogon</i> ..	Peat and loam	} The very tips of the young shoots will strike with care, but not readily.
<i>Leucospermum</i>	Light loam	
<i>Leysera</i>	Peat soil	By cuttings.
<i>Liatris</i>	Peat soil	By seeds, or dividing the roots.
<i>Lightfootia</i> , ...	Loam and peat	Cuttings of the young shoots strike freely.
<i>Ligustrum</i>	Loam and peat	} Cuttings of the young wood strike freely, or by inarching on the common <i>Privet</i> .
<i>Linaria</i>	Peat and loam	
<i>Linum</i>	Peat and loam.....	By cuttings of the young wood.
<i>Liparia</i>	Peat and loam	} The very tips of the young shoots should be chosen for cuttings, which, with care, will strike roots.
<i>Lobelia</i>	Any rich soil ..:.....	

Soil.	Mode of Propagation.
LoddigesiaSandy loam and peat	Cuttings of the young wood strike freely.
LoganiaPeat and loam	Cuttings of the ripened wood will root.
LomatiaPeat and loam	Ripened cuttings taken off at a joint will strike root.
LoniceraRich light soil	Cuttings of the ripened wood strike root freely.
LotusPeat and loam	} From seeds which ripen in most species freely, and also by cuttings of the young wood.
LychnisPeat and loam	
LyciumLoam and peat	Ripened cuttings strike freely.
LythrumPeat and loam	By cuttings of the young wood.
MagnoliaPeat soil	} By cuttings of the ripened wood, and some of them by inarching or budding on the com- mon sorts.
MaherniaLoam and Peat	
MalvaLoam and peat	By seeds, and cuttings of the young wood.
MaricaLoam and peat	By offsets, and also by seeds.
MarrubiumLight rich soil	Cuttings strike freely.
MassoniaSandy loam and peat	By seeds, and by offsets from the bulbs.
MathiolaLight soil	Readily by cuttings.
MaurandiaLight rich soil	Freely by seeds, and also by cuttings.
MedicagoPeat and loam	By seeds and by cuttings.
MelaleucaPeat and loam	} Ripened cuttings not too old strike pretty freely. Seeds are also sometimes ripened, which readily vegetate.
MelanthiumSandy loam and peat	
MeliaLoam and peat	By seeds which often ripen.
MelianthusPeat and loam	Readily by cuttings.
MenispermumLoam and peat	Cuttings propagate readily.
Mesembryan- themum }Light soil	} Freely by cuttings, if kept dry.
MespilusLoam and peat	
MetrosiderosPeat and loam	} Best from seeds; cuttings of the ripened wood sometimes strike, but not without difficulty.
MikaniaPeat and loam	
MimulusLight rich soil	Readily by cuttings.
MirbeliaSandy loam and peat	} By cuttings, and also by seed, which sometimes ripen.
MonsoniaTurfy loam	
MontiniaLoam and peat	By cuttings.
MorinaLight rich soil	By seeds, and by dividing at the root.
MundiaSandy peat	Cuttings of the young wood strike freely.
MurraPeat and loam	By cuttings in a bottom-heat.
MyoporumLoam and peat	By cuttings.
MyricaLoam and peat	Cuttings of the young wood strike freely.
MyrsineLoam and peat	By cuttings.
MyrtusPeat and loam	By cuttings not too ripe.
NandinaPeat and loam	} Cuttings, with their leaves not shortened, root freely.
NemesiaRich soil	

Soil.	Mode of Propagation.
Nerium.....	Rich soil By cuttings of the young wood.
Nicotiana.....	Rich soil By seeds.
Nivenia	Sandy loam..... { Not readily; ripened cuttings, however, some- times succeed.
Ocymum.....	Light rich soil By cuttings.
Ædera.....	Peat and loam By young cuttings.
Ænothera.....	Peat and loam..... Cuttings root freely.
Olea.....	Rich soil { By cuttings, but more readily by grafting on the common <i>Privet</i> .
Ononis	Peat and loam..... { Cuttings strike freely, and seeds are sometimes ripened which vegetate freely.
Onosma	Peat and loam By cuttings.
Ophiopogon ..	Peat and loam..... By dividing the roots.
Origanum....	Loam and peat..... Cuttings strike freely.
Ornithogalum..	Loam and peat..... By offsets from the bulbs.
Osteospermum	Peat and loam..... By cuttings freely.
Osyris.....	Loam and peat..... Cuttings of the ripened wood strike freely.
Othonna.....	Peat and loam Cuttings strike freely.
Oxalis.....	Light rich soil { Sometimes by seeds, and generally by offsets from the bulbs.
Oxylobium....	Peat soil { Cuttings strike root with care, and some of the species ripen seeds.
Pallasia	Light rich soil By cuttings.
Pancratium ...	Light rich soil By offsets from the bulbs, and sometimes from seeds.
Passerina	Peat and loam..... Young cuttings strike freely.
Passiflora	Rich soil { By cuttings, which should be taken off while very young; some of the species perfect seeds by which hybrides are produced.
Patersonia	Peat and loam..... By dividing at the root.
Pavonia	Peat and loam..... { As seeds often ripen, it may be increased by them, or by cuttings of the young wood.
Pelargonium ..	Light rich soil By cuttings, seeds, &c.
Pentzia.....	Peat and loam. By cuttings.
Persoonia.....	Peat and loam..... { Not readily; cuttings of the ripened wood some- times root.
Phlomis	Peat and loam..... By cuttings.
Phormium	Peat and loam..... By offsets from the root.
Photinia....	Peat and loam { By cuttings of the ripened wood, and also by grafting or inarching on the different kinds of <i>Pyrus</i> or <i>Mespilus</i> .
Phylla	Peat and loam..... Cuttings of the young wood strike freely.
Phyllobium ..	Loam and peat Cuttings of the young wood will root freely.
Pimelea.....	Sandy peat By cuttings of very young wood, and also by seeds.
Pinckneya	Peat and loam Cuttings root freely.
Pinus	Any ordinary soil { Most of the species are difficult to perpetuate otherwise than by seeds; some will, how- ever, strike by cuttings.
Pisonia	Loam and peat By cuttings.

Soil.	Mode of Propagation.
PistachiaLoam and peat	} Cuttings of the ripened wood strike root, but require a long time.
PittosporumPeat and loam	
PlatylobiumPeat soil	} Seeds are sometimes ripened which produce fine plants; they are also propagated by cuttings.
PlectranthusPeat and loam	
PlectroniaPeat and loam	Cuttings of the ripened wood strike root.
PlumbagoPeat and loam	Cuttings root readily in a bottom heat.
PodolepisLoam and peat	By dividing near the root.
PodocarpusPeat and loam	Not readily propagated by cuttings.
PodolobiumSandy peat	Best by seeds, although cuttings strike pretty freely.
PogoniaSandy peat	By offsets from the roots.
PolygalaPeat and loam	} From the nature of the plants, it is difficult to get many cuttings of them; if the leading shoots be topped, plenty of lateral shoots will be produced, which will strike root as cuttings.
PomaderrisLoam and peat	
PoteriumPeat and loam	Young cuttings ripen freely.
PrasiumLight rich soil	By cuttings.
ProstantheraPeat and loam	By cuttings.
ProteaSandy loam	} This genus is not readily propagated otherwise than by seeds. Cuttings are sometimes rooted, but not readily, and that only in the case of a few species.
PrunusPeat and loam	
PsoraleaPeat and loam	Cuttings of the young wood strike pretty freely.
PteroniaPeat and loam	By cuttings freely.
PultenæaSandy loam and peat	Cuttings propagate freely.
PunicaPeat and loam	By cuttings.
RafniaSandy loam and peat	By ripened cuttings.
RaphiolepisLoam and peat	Best by seeds, but will also succeed by cuttings.
ReaumuriaPeat and loam	Cuttings of the ripened wood strike freely.
RelhaniaPeat and loam	By cuttings.
RestioPeat and loam	By cuttings.
RhagodiaPeat and loam	By dividing the roots.
RhamnusPeat and loam	By cuttings.
RhusPeat and loam	By cuttings of the ripened wood.
RieinusLoam and peat	By cuttings of the ripened wood.
RoeliaSandy peat	Cuttings, taken off at a joint, freely strike root.
RoyenaLoam and peat	By cuttings.
RubusLoam and peat	Ripened cuttings strike freely.
RuelliaPeat and loam	By cuttings.
RuseusRich light soil	By cuttings.
RutaAny light soil	By dividing the roots.
SagittariaAny light soil	Cuttings of the young shoots readily strike root.
SalicorniaPeat and loam	An aquatic genus; by dividing at the root.
SalicorniaAny light soil	By cuttings.

Soil.	Mode of Propagation.
Salvia	Any rich soil By cuttings freely.
Satureja	Rich light soil By cuttings.
Satyrium	Sandy loam and peat By seed.
Scabiosa	Peat and loam By seeds, and also by cuttings.
Scævola	Peat and loam By cuttings.
Schinus	Loam and peat { Cuttings of the ripened wood, having the leaves left unshortened, strike in a mild bottom-heat.
Schisandra	Sandy peat and loam Ripened cuttings root freely.
Schotia	Peat and loam Ripened cuttings root freely.
Scleroxylon	Loam and peat Ripened cuttings strike pretty freely.
Scottia	Loam and peat { Is said to be readily propagated by cuttings, taken off at a joint while young; the only plants we have seen have been originated from seeds: it is still rare.
Scutellaria	Light rich soil By cuttings.
Selago	Peat and loam Cuttings strike freely.
Sempervivum	Light soil { Cuttings taken off and dried for a few days root freely.
Senecio	Peat and loam Most readily by cuttings.
Septas	Sandy loam and peat Dividing the roots.
Sida	Light soil By seeds, and also by cuttings.
Sideritis	Light rich soil Cuttings root pretty freely.
Sideroxylon	Loam and peat { The half-ripened shoots root, but not without difficulty.
Silene	Light soil Readily by cuttings.
Smilax	Loam and peat By dividing at the root.
Solanum	Light rich soil Either by cuttings or seeds.
Sorocephalus	Light loam Treated like <i>Protea</i> , &c.
Sowerbæa	Peat soil By dividing at the root.
Sparmania	Peat and loam By cuttings readily.
Spartium	Peat and loam { By seeds, and sometimes by cuttings of the young wood.
Sphærolobeum	Sandy peat By seeds and cuttings.
Spiclmannia	Peat and loam Cuttings root freely.
Spigelia	Sandy peat Cuttings root freely.
Sprengelia	Sandy peat By cuttings of the young wood.
Stachys	Peat and loam By cuttings freely.
Statice	Sandy loam and peat By seeds, and by dividing the plant near the roots.
Stenantha	Sandy peat By cuttings of the young wood.
Stenocarpus	Loam and peat Ripened cuttings strike root, but not freely.
Stenochilus	Peat and loam Ripened cuttings strike root, but not freely.
Sterculia	Rich loam and peat Ripened cuttings strike freely.
Stevia	Sandy loam and peat By cuttings.
Stillingia	Rich light soil Readily by cuttings.
Stobæa	Rich light soil By cuttings.
Struthiola	Peat and loam By cuttings of the young wood.
Stylidium	Sandy peat By cuttings.
Styphelia	Sandy loam and peat Cuttings of the young wood root freely.

Soil.	Mode of Propagation
Sutherlandia .. Loam and peat	Readily by seeds.
Swainsonia Loam and peat	By seeds, and also by cuttings.
Tarhonanthus. Peat and loam	By cuttings.
Telopea Light loam and peat	} There are but few instances of its propagating by any other means than from seeds, which are not often imported: hence its being so scarce.
Tempeltonia .. Loam and peat	
Teucrium Peat and loam	Cuttings root freely.
Thomasia Peat and loam	By cuttings.
Thuja Peat and loam	By cuttings.
Trachelium Peat and loam	By seeds or cuttings.
Tristania Peat and loam	By cuttings of the half-ripened wood.
Tritoma Peat soil	By dividing the roots.
Tropæolum Rich light soil	Cuttings root freely.
Tulbagia Light sandy soil	By offsets from the bulbs.
Uvularia Loam and peat	By dividing at the roots.
Veltheimia Light loam	As most bulbous plants.
Veronica Peat and loam	By cuttings.
Vinca Peat and loam	Cuttings of the young wood root freely.
Villarsia Peat and loam	} An aquatic genus, increased by dividing the roots, or by seeds, which are produced in abundance.
Viminaria Sandy peat	
Virgilia Loam and peat	Cuttings of the young wood strike freely.
Vitex Loam and peat	By cuttings.
Wachindorfia Sandy loam and peat	By offsets from the bulbs, or by seeds.
Watsonia Sandy loam and peat	In the same way as the last genus.
Westringia Peat and loam	Cuttings of the young shoots root freely.
Witsenia Sandy peat	By offsets from the roots, or by seeds.
Woodwardia Peat and veget. mould	} Like most others of the Fern tribes, may be increased by dividing the roots, or by seeds.
Xerotes Loam and peat	
Xylomelum Peat and loam	} By cuttings of the young wood, but with considerable difficulty.
Yucca Rich loamy soil	
Zieria Peat and loam	Cuttings of the young wood root freely.
Zygophyllum Peat and loam	By cuttings, which root freely.

A
 SYSTEMATIC CATALOGUE
 OF
 CONSERVATORY PLANTS

ACACIA.

Undulata.
 Oxycedrus.
 Impressa.
 Pendula.
 Cordifolia.
 Verticillata.
 Juniperina.
 Taxifolia.
 Diffusa.
 Lunata.
 Suaveolens.
 Floribunda.
 Uncinata.
 Longissima.
 Longifolia.
 Viscosa.
 Linifolia.
 Falcata.
 Dicipiens.
 Hybrida.
 Armata.
 Alata.
 Pulchilla.
 Strigosa.
 Nigricans.
 Pubescens.
 Discolor.
 Mollissima.
 Dealbata.
 Decurrens.

ANTHYLLIS, Barba-jovis.

ALSTRÆMERIA, Simsii.

ANDERSONIA, Springelioides.

ANDROMEDA, Ovalifolia.

ANIGOSANTHUS, Flavida.

ARBUTUS.

Canariensis.
 Andrachne.
 Laurifolia.

ARDESIA, Lentiginosa.

ASTER, Argophyllas.

AZALEA

Indica.

a *Var. Punicea.*

b *Alba.*

c *Purpuria.*

d *Lutea.*

Sinensis.

ARAUCARIA.

Brasiliana.
 Excelsa.

BEAUFORTIA.

Decusata.
 Sparsa.

BÆCKEA.

Virgata.
 Frutescens.

BERBERIS.

Pinnata.
 Fascicularis.

BANKSIA : (all the species.)

BORBONIA.

Cordata.
 Trinerva.
 Lanciolata.

BORONIA.

Alata.
 Denticulata.
 Pinnata.
 Serrulata.

- BOSSIÆA.
 Linifolia.
 Scolopendrium.
- BURCHELLIA.
 Capensis.
 Parviflora.
- CALLICOMA, Serratifolia.
- CALCEOLARIA.
 Corymbosa.
 Rugosa.
 Integrifolia.
 Scabiosæfolia.
- CALLISTACHYS.
 Ovata.
 Lanciolata.
- CALLISTEMON.
 Speciosum.
 Lanciolatum.
 Salignum.
 Marginatum.
 Rigidum.
 Lineare.
 Formosum.
 Microphyllum.
- CALOTHAMNUS.
 Clavatus.
 Quadrifidus.
 Villosus
- CAMELLIA JAPONICA : (all the species
 and varieties.)
- CARMICHLÆLIA, Austeralis.
- CANNA.
 Flacida.
 Glauca.
 Limbata.
 Indica.
 Iridiflora.
- CASUARINA.
 Equisetifolia
 Torulosa.
 Stricta.
 Distyla.
- CHORIZEMA.
 Henschmanni.
 Illicifolia.
- CLETHERA, Arborea.
- CORRÆA.
 Alba.
 Speciosa.
- Virens.
 Pulchilla.
- CROWEA, Saligna.
- CURTISIA, Fuginia.
- CUSSONIA.
 Spicata.
 Thyrciflora.
- CYCAS, Revoluta.
- CUNONIA, Capensis.
- DAVIESIA.
 Latifolia.
 Corymbosa.
 Ulicina.
 Glauca.
- DAIS, Cotonifolia.
- DAPHNE, Odora.
- DATURA, Arborea.
- DILLWYNIA.
 Pungens.
 Rudis.
 Phylicifolia.
 Florabunda.
 Ericæfolia.
- DORYANTHUS, Excelsa.
- DONIA, Viscosa.
- DRACÆNA.
 Australis.
 Indivisa.
 Undulata.
- DRYANDRIA : (all the species.)
- ELÆOCARPUS, Cyaneus.
- ENTELEA, Arborescens.
- ERYTHRINA.
 Crista-galli.
 Laurifolia.
- ENKIANTHUS.
 Quinqueflorus.
 Reticulatus.
- EPACRIS.
 Grandiflora.
 Purpurescens.
- EUDESMIA, Tetragona.
- EUCALYPTUS.
 Globulus.
 Obliqua.
 Piperita.
 Corymbosa.
 Robusta.

- EUGENIA.
 Smithii.
 Myrtifolia.
- EUCHILUS, Oboordatus.
- EUTAXIA, Myrtifolia.
- FABRICIA.
 Myrtifolia.
 Lævigata.
 Sericia.
- FIGUS.
 Australis.
 Elastica.
 Capensis.
- FUCHSIA : (all the species.)
- GASTROLOBUM, Bilobum.
- GOODIA.
 Latifolia.
 Pubescens.
 Retusa.
 Sub-pubescens.
- GNIDIA : (all the species.)
- GOMPHOLOBIUM.
 Grandiflorum.
 Polymorphum.
- GREVILLEA : (all the species.)
- GORDONIA, Lisianthus.
- HAKEA : (all the species.)
- HOVEA.
 Chorizemæfolia.
 Celsi.
 Lauciolata.
- HOVENIA, Dulcis.
- HUMEA, Elegans.
- ILLICIUM.
 Floridanum.
 Anisatum.
 Parviflorum.
- INDIGOFERA, Australis.
- JACKSONIA, Scoparia.
- JACARANDA, Mimosifolia.
- LAGERSTRÆMIA, Indica.
- LAMARKIA, Dentala.
- LASIOPETALUM.
 Arborescens.
Seringia Platyphylla.
 Ferrugineum.
 Parviflorum.
 Purpureum.
Thomasia Purpurca
 Solanacea.
- Thomasia Solanacea.*
 Quercifolia.
Thomasia Quercifolia.
- LEPTOSPERMUM : (all the species.)
- LOMATIA, Longifolia.
- LODDIGESIA, Oxalidifolia.
- MAGNOLIA.
 Fuscata.
 Annonafolia.
 Pumila.
- MELALEUCA : (all the species.)
- METROSIDEROS.
 Hispida.
 Floribunda.
 Glomulifera.
 Angustifolia.
 Costata.
- NANDINA, Domestica.
- NERIUM, Splendens.
- PÆONIA.
 Moutan.
 Var. *Papaveracea.*
- PITTOSPORUM : (all the species.)
- PIMELEA : (all the species.)
- PLATYLOBIUM.
 Formosum.
 Triangulare.
 Parviflorum.
- PLUMBAGO, Capensis.
- PODALYRIA.
 Sericea.
 Biflora.
 Styracifolia.
 Hirsuta.
 Buxifolia.
- POLYGALA.
 Attenuata.
 Oppositifolia.
 Cordifolia.
 Latifolia.
 Myrtifolia.
 Bracteolata.
 Simplex.
 Speciosa.
 Teretifolia.
 Borboniæfolia.
 Ligularis.
 Umbellata.
- POMADERRIS.
 Apetala.

Elliptica.	STENOCARPUS, Saligna.
Acuminata.	STRUTHIOLA : (all the species.)
PROSTANTHERA.	TELOPEA, Speciosissima.
Lasianthos.	TEMPELLONIA.
Denticulata.	Glauca.
PULTENÆA : (all the species.)	Retusa.
RHODODENDRON, Arborea.	TRISTANIA, Nerifolia.
RUTA, Albiflora.	WESTRINGIA, Rosmarinifolia.
STENANTHERA, Pinifolia.	VIMINARIA, Denudata.
STENOCHILUS, Maculata.	VIRGILIA, Intrusa.

GREEN-HOUSE PLANTS.

ACACIA : (<i>as in Conservatory List.</i>)	AOTUS.
ACHILLEA, Ægyptiaca.	Virgata.
ACROSTICUM.	Villosus.
Alcicorne.	ANTHYLLIS.
Aureum.	Linifolia.
Vellum.	Barba-jovis.
Lingua.	Hetrophylla.
AGAPANTHUS.	ARCTOTUS.
Umbullatus.	Acaulis.
Minor.	Tricolor.
AITONIA, Capensis.	Grandiflora.
ALOE : (many species.)	Speciosa.
ALONSOA.	Bicolor.
Incisifolia.	Arborescens.
Acutifolia.	ASPALATHUS.
Linearis.	Carnosa.
ALSTRÆMERIA.	Argentea.
Pelegrina.	Ciliaris.
Hookeri.	Albens.
Flos-Martini.	Hispida.
Ovata.	ARDUINA, Bispinosa.
AMARYLLIS : (many species.)	ARISTEA.
ANAGALLIS.	Cyanea.
Latifolia.	Spiralis.
Colina.	Capitata.
Monelli.	Melaleuca.
Linifolia.	ASPIDIUM, Axillare.
ANDERSONIA, Sprengelioides.	ASPLENIUM.
ANIGOSANTHUS, Flavida.	Dentex.
ANTHOLYZA, (many species.)	Odontites.
	Hemionitis

- ASTROLOMA, Humifusum.
 AULAX, Umbellata.
 AZALIA : (*as in Conservatory List.*)
 BÆKIA, Virgata.
 BANKSIA : (the whole genera.)
 BORBONIA : (all the species.)
 BORONIA : (all the genera.)
 BOSSLEA : (all the genera.)
 BOUVARDIA.
 Triphylla, *et varieties.*
 BRUNIA.
 Nodiflora.
 Alopecuroides.
 Plumosa.
 Superba.
 Formosa.
 Ciliata.
 Cornosa.
 Paleacea.
 Ericoides.
 BUBON, Galbanum.
 BURCHILLIA, Capensis.
 CALCEOLARIA : (all the species.)
 CACALIA.
 Repens.
 Articulata.
 Tomentosa.
 CALLISTACHYS : (all the genera.)
 CALLISTEMON : (*as in Conservatory List.*)
 CALOTHAMNUS.
 Villosus.
 Clavatus.
 Quadrifidus.
 CAMELLIA : (all the genera, with var.)
 CARMECHÆLIA, Australis.
 CAMPANULA.
 Gracilis.
 Stricta.
 Littoralis.
 Quadrifida.
 Aurea.
 Cernua.
 Mollis.
 Saxatilis.
 Laciniata.
 CHIRONIA.
 Decussata.
 Frutescens.
 Linoides.
 Angustifolia.
 Baccifera.
 Lychnoides.
 CHENOLIA, Diffusa.
 CHORIZEMA.
 Nana.
 Ilicifolia.
 Henchmanii.
 CINERARIA.
 Geifolia.
 Canescens.
 Aurita.
 Lunata.
 Hybrida.
 Elatior.
 Cruenta.
 Pulchilla.
 Populifolia.
 Lobata.
 Præcox.
 Linifolia.
 Humifusa.
 CISTUS : (all the tender species.)
 COLLETIA, Seratifolia.
 CORONILLA.
 Glauca.
 Juncea.
 Argentea.
 Viminalis.
 CORRÆA : (all the genera.)
 CRASSULA.
 Orbicularis.
 Rosularis.
 Cotyledon.
 Cordata.
 Pellucida.
 Perfilata.
 Imbricata.
 Columnaris.
 Ramuliflora.
 Concinna.
 Ligulifolia.
 Obliqua.
 Arborescens.
 Ramosa.
 CRINUM : (several species.)
 CYCAS, Revoluta.

CYCLAMEN.

Persicum, *et varieties.*

CROWEA aligna.

CYCLOPIA.

Genistoides.

Elata.

Ternata.

Triphylla.

CYRTANTHUS: (all the species.)

DAPHNE, Odora.

DAVIESIA: (all the species.)

DILLWYNIA: (all the specie .)

DIONÆCA, Muscipula.

DIOSMA: (all the species.)

DICHONDRA, Sericia.

DIGITALIS, Sceptrum.

DISANDRIA, Prosterata.

DORYANTHUS, Excelsa.

DRYANDRIA: (all the genera.)

EICHEUM: (all the tender species.)

ELICHRYSUM: (all the genus.)

ERODIUM.

Incarnatum.

Hirtum.

Crassifolium.

EPACRIS: (all the genus.)

ERICA is a genus so popular, it would be vain to make a selection. Where there is any attempt at collection there should not be less than from 200 to 300 species of this family.

ERYTHRINA.

Crista-galli.

Laurifolia.

EUPHORBIA.

Caput-Medusæ.

Mellifera.

EUCHILUS, Obcordata.

EUTAXIA, Myrtifolia.

EXACUM, Viscosam.

FALKIA, Repens.

FABRICIA: (*as in Conservatory List.*)

FUCHSIA: (*as in Conservatory List.*)

GARDENIA.

Florida.

Radicans.

GLADIOLUS: (many species.)

GLOXINIA.

Speciosa.

Maceulata.

GNAPHALIUM: (all the genus.)

GOMPHOLOBIUM: (all the genus.)

GOODIA: (all the genus.)

GORTERIA: (all the genus.)

GREVILLEA: (*as in Conservatory List.*)

HAKIA: (*as in Conservatory List.*)

HALLERIA, Lucida.

HELIOTROPIUM.

Peruvianum.

Corymbosum.

HERMANNIA: (several species.)

HIBISCUS.

Scaber.

Hetrophyllus.

neanus.

Speciosus.

Grandiflorus.

Hispidus.

Richardsoni.

Patersonii.

HOAREA: (many species.)

HOVEA: (all the genus.)

HUMEA, Elegans.

HYDRANGEA, Hortensis.

HYPERICUM: (all the tender species.)

ILLICIUM: (*as in Conservatory List.*)

INDIGOFERA.

Filifolia.

Sericia.

Candicans.

Amœna.

Stipularis.

Denudata.

Cytisoides.

Frutescens.

Australis.

ISOTOMA, Axilaris.

IXODIA, Achellioides.

JACKSONIA, Scoparia.

ISOPOGON.

Formosus.

Anemonefolius.

Longifolius.

Trilobus.

Teretifolius.

IXIA: (many species.)

JACARANDIA, Mimosifolia.

LAGERSTÆMIA, Indica.

- LACHENALIA.**
 Tricolor.
 Punctata.
 Flava.
 Pendula.
- LAMBERTIA.**
 Formosa.
 Echinata.
- LAURUS.**
 Borbonia.
 Glauca.
 Camphora.
- LECHENAULLIA, Formosa.**
- LASIOPETALUM: (as in Conservatory List.)**
- LEPTOSPERMUM: (as in Conservatory List.)**
- LEUCADENDRON, Argenteum.**
- LOBELIA.**
 Unidentata
 Pinifolia.
 Bellidifolia.
 Campanuloides.
 Illicifolia.
 Pubescens.
 Lutea.
 Coronopifolia.
- LODDIGESIA, Oxalidifolia.**
- LOTUS, Jacoea.**
- MAGNOLIA.**
 Pumila.
 Fuscata.
 Annonafolia.
- MAHERNIA.**
 Incisa.
 Diffusa.
 Burchellii.
- MALVA.**
 Scabra.
 Capensis.
 Elegans.
 Grossularifolia.
- MASSONIA: (many species.)**
- MELALEUCA: (as in Conservatory List.)**
- MESEMBRYANTHEMUM: (most of the genus.)**
- METROSIDEROS: (as in Conservatory List.)**
- MIMULUS, Glutinosa.**
- MELIANTHUS.**
 Major.
 Minor.
- MYRTUS, Communis.**
- MYOPORUM: (all the genus.)**
- NERIUM.**
 Oliander.
 Splendens.
- NANDINA, Domestica.**
- ŒDERA, Prolifera.**
- ONONIS.**
 Glabra.
 Natrix.
 Crispa.
- OSTEOSPERMUM, Grandiflorum.**
- OXALIS: (many species.)**
- OXYLOBIUM, Cordifolium.**
- PAVONIA, Præmorsa.**
- PASSERINA.**
 Laxa.
 Filiformis.
 Grandiflora.
 Spicata.
 Ciliata.
- PENŒA.**
 Marginata.
 Squamosa.
 Mucronata.
- PIMELEA: (all the genus.)**
- PHYLICA: (several species.)**
- PITTIOSPORUM: (as in Conservatory List.)**
- PLATYLOBIUM: (all the genus.)**
- POLYGALA: (all the genus.)**
- PULTENŒA: (all the genus.)**
- PODOLOBIUM: (all the genus.)**
- PRIMULA, Prænitens.**
- PROSTANTHERA.**
 Lasianthos.
 Violacea.
- PROTEA: (many species.)**
- RAFNIA.**
 Amplexicaulis.
 Elliptica.
 Cunifolia.
 Triflora.
 Opposita.
- ROELLIA, Ciliata.**
- RUTA, Albiflora.**

- SALVIA.**
 Coccinia.
 Pulchilla.
 Colorata.
- SCHOTIA.**
 Speciosa.
 Tamarindifolia.
- SCOTTIA, Dentata.**
- SELAGO.**
 Corombosa.
 Spicata.
- SEMPERVIVIVUM.**
 Arboreum.
 Tabulæforme.
- S PHORA : (several species.)**
- SERMANNIA, Africana.**
- PARTIVM.**
 Monospermum.
 Sphærocarpum.
- SPHÆROLOBIUM.**
 Vimineum.
 Medium.
- STAAVIA.**
 Radiata
 Glutinosa.
- SOLANUM.**
 Laciniatum.
 Quercifolia.
 Marginata.
- SOWERBEA, Juncea.**
- SPIELMANNIA, Africana.**
- TAXUS, Nucifera.**
- TEMPELTONIA.**
 Retusa.
 Glauca.
- THOMASIA. See *Lasiopetalum.***
- TELOPEA, Speciosissima.**
- TREVIRANIA, Coccinia.**
- TRISTINIA, Neriifolia.**
- TROPÆOLUM.**
 Minus, *flora pleno.*
 Majus, *flora pleno.*
 Hybridum.
 Pinnatum.
- VERONICA, Perfoliata.**
- VIMINARIA, Denudata.**
- VERBENA.**
 Aubletia.
 Lambertii.
- WESTRINGA, Rosmarinifolia.**
- ZIERIA, Smithii.**

GREEN-HOUSE AND CONSERVATORY CLIMBERS.

- ARISTOLOCHIA.**
 Glauca.
 Sempervirens.
 Rotunda.
 Hirta.
- ASPARAGUS.**
 Retrofractus.
 Capensis.
 Scandens.
- BIGNONIA, Capreolata.**
- BILLARDIERA : (all the genus.)**
- BRACHYSEMA.**
 Latifolia.
 Undulata.
- CLEMATIS.**
 Coriacea.
 Aristata.
 Hedysarefolia.
 Brachiata.
- CISSUS.**
 Antartctica.
 Capensis.

Pentaphylla.	Acuminatum.
Quinata.	Azoricum.
COBÆA, Scandens.	Grandiflorum.
DOLICHOS.	Odoratissimum.
Hirsutus.	KENNEDIA: (all the genus.)
Lignosus.	MIKANIA, Scandens.
Capensis.	MAURANDIA.
EUSTREPHUS.	Semperflorans.
Latifolius.	Antirrhiniflora.
Angustifolius.	Barkleyana.
GLYCINE.	PASSIFLORA.
Secunda.	Lutea.
Bituminosa.	Maculata.
Angustifolia.	Cœrulia-racimosa.
Hetrophylla.	Alato-Cœrulia.
GELSEMIUM, Sempervirens.	Edulis.
HOYA, Carinosa.	Chinensis.
HIBBERTIA.	Filementosa.
Grossalariaefolia.	Herbertiana.
Volubilis.	Adiantifolia.
Dentata.	RUBUS, Moleucanus.
IPOMEA.	RUSCUS.
Sinuata.	Androgynus.
Pendula.	Reticulatus.
Carolina.	Volubilis.
JASMINUM.	SMILAX, Australis.
Gracile.	TESTUDINARIA, Elephantipes.

In offering the Systematic Catalogues, both of Fruits and Flowers, we do not mean to advise collections to be exclusively formed from them, as many valuable fruits are yearly coming into notice; and however favorable circumstances may have been to bring a vast number of sorts under our observation, there are some that we have never seen, and many that are not definitely settled as to name, &c., of which we could give no correct description. As far as the nature of the case would admit, we have described no fruit, nor enumerated any plant, which we have not seen in some state or other. In reference to the Catalogue of Conservatory Plants, it is entirely formed of such plants as we have either cultivated or seen cultivated with success; and the plants in the Green-house List are such as, according to our view of the case, would form a very complete collection where a display of bloom is more a desideratum than a full botanical enumeration, when the number of species are generally more appreciated than an abundance of flowers, or diversity of foliage.

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CACTUS GRANDIFLORA.

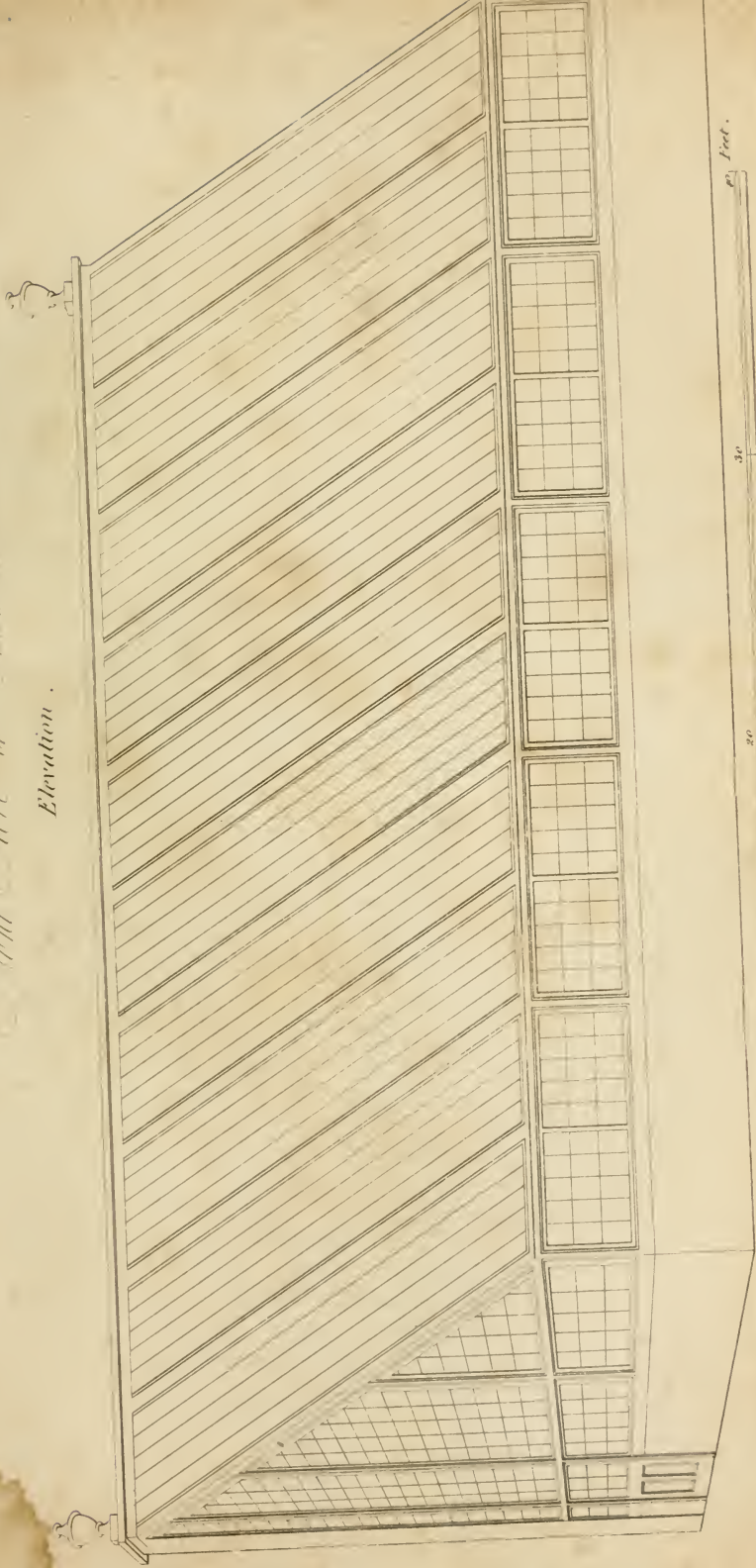


Drawn by E. J. Smith at Mr. Anderson's
Garden, Wexford, Ireland, in the year
1845.

Engraved by Thomas Agnew & Sons, London.

Copy of the Plan of the

Elevation.



Scale of

5

10

20

30

Feet.

London, Published by, Tho. Kelly 17, Paternoster Row Aug^o 1^o 1829.

E. Turrell sc.



GENERAL MANAGEMENT
OF THE
STOVE DEPARTMENT.

INTRODUCTION.

THE plant-stove is a department in horticulture, dedicated to the cultivation of such plants as are natives of tropical or warm climates, and which will not prosper in any of the other plant structures noticed in a former part of this work. The degree of temperature suitable for those plants which enter into this department is necessarily very high, varying from a minimum of 60, to 90 degrees or upwards, of Fahrenheit, as a maximum.

Stoves are much less numerous in the British gardens than other plant structures, and consequently the management of them is generally much less understood. The expense attending them is the most probable cause of their limited number, and certainly not any want of interest or splendour in the plants or their flowers. To this division, in fact, belongs most of the splendid flowering, eccentric, and curious plants, and indeed those which supply us with some of our most valuable spices, vegetable medicines, oils, gums, and dyes; including many which we are only acquainted with as far as their history is connected with the arts or sciences, or by particularities related of them by travellers. A portion of them supply a numerous part of mankind with food who are yet in a state of natural simplicity, and many of them constitute a considerable part of the importations of this country, and thence become beneficial, not only as a lucrative reward to the speculator, but also as diffusing comfort and sustenance to a large portion of the community. Coffee, sugar, cocoa, sago, and chocolate, may be enumerated, amongst many others, as constituting a useful part of our daily food; and Jesuit's-bark, cinnamon, ipecacuanha, balsam of capivi, cassia, and gum-

arabic, may be mentioned as valuable medicines; as also *Quassia Amara*, the bitter of porter, so much used in the making of that liquor. Connected with the useful arts, we may notice lance-wood, mahogany, log-wood, cotton-tree, and Indian-rubber; and, as vegetable curiosities, may be noticed the air-plants, arborescent ferns, and that most extraordinary of all parasites, *Rafflesia Arnoldi*, discovered in 1818, in a jingle in Sumatra, by Dr. Arnold, and jointly named after him and the late Sir Stamford Raffles; the following description of which is to be found in the Transactions of the Linnæan Society:—"The plant consists of the flower only, having neither leaves, branches, nor roots; the flower is a yard across; the petals, which are subrotund, being twelve inches from the base to the apex, and it being about a foot from the insertion of the one petal to the opposite one; the petals are from a fourth to three-fourths of an inch thick, and the nectarium, it is supposed, would hold twelve pints. It appears to take its origin in some crack or hollow of the stem, and soon shows itself in the form of a round knob, which, when cut through, exhibits the infant flower, enveloped in numerous bracteal sheaths, which successively open and wither away as the flower enlarges."

Stoves may be considered as of two kinds: the humid or bark-stove, and the succulent or dry-stove. In the former are cultivated all plants that require a moist, and at the same time a high temperature, while in the latter are cultivated those which can live long without water in a high temperature; and these are for the most part succulent plants, as *Cactus*, *Euphorbia*, *Aloe*, &c.

CONSTRUCTION OF THE BARK-STOVE.

In the construction of a stove-house, calculated for the cultivation of tropical plants, much depends upon the taste and object of the owner. Some cultivators prefer small plants, and limited or select collections, whilst others affect large specimens and extensive collections. In the former case, a stove may be constructed to answer every purpose of the owner, differing little from that of the pine-house in common use, but

of course loftier ; and as the plants in a stove are, or ought to be, at all times seen to the greatest advantage, they should stand on a bed in the middle of the house, having a passage sufficiently broad all round it. The accompanying plates represent the elevation and ground-plan of one of the plant-stoves at Claremont, the country-seat of H. R. H. Prince Leopold of Saxe-Cobourg Saalfeld, in which are cultivated plants which do not attain a great size, or such as it is desirable to have in flower while in a young state. Such also are the stoves at Bury-Hill and Bayswater, in which tropical plants have long been successfully cultivated by their respective superintendents. In those cases where the fancy of the proprietor leads him to have large specimens of the more lofty growing kinds of plants, such as palms, *Musas*, &c., houses of more capacious dimensions are required ; and on that head we may refer to the large palm-stove of Messrs. Loddige, or the still more magnificent tropical-house of Mrs. Beaumont, at Britton-Hall in Yorkshire. The interior of the former is one of the greatest treats the lover of plants can be indulged with in the vicinity of London, and reflects the greatest credit on the very spirited proprietors. The exterior, however, is deficient in taste and elegance. The latter is an immense dome, and possesses all that degree of elegance for which such houses are supposed to be so eminently distinguished. The plants which enter into such houses, are so exceedingly rapid in their growth, and attain so enormous a bulk, that no house hitherto built in this country has been found sufficiently large for them, in which they can develop their true characters. Plant-stoves require the highest degree of temperature of all other horticultural erections, and consequently many opinions have been pronounced on the means of producing that temperature upon the best and most economical principle. Steam-pipes, in conjunction with flues, and sometimes by themselves, have been tried, and steam has been applied under the bed upon which the plants stand ; which, by passing through a stratum of coal-ashes, tan, or similar matter, heated the atmosphere of the house, while at the same time it rendered the bed upon which the plants either stood on, or were plunged in, sufficiently warm. Formerly, as a greater degree of bottom-heat was used in the cultivation of tro-

pical plants than is now used for the cultivation of pines, we then found the pots plunged into beds of fermenting tanners' bark ; but latterly, however, this method is almost abandoned, and we find stove-plants now almost universally cultivated without much bottom-heat, at least with no more than they receive from the atmosphere of the house. A bed of prepared coal-ashes, rendered perfectly porous beneath, to admit of all superfluous water passing off, is now used, on which the plants are set ; and it is only in particular cases that we now find them plunged in a bottom-heat.

Upon this subject, Mr. Sweet, a botanical cultivator of the first eminence, offers the following remarks :—“Some hot dung or tan may be still kept in the pit to throw up a little warmth, on which should be put a good thickness of sand or gravel for the pots to stand on, and the plants will thrive much better than if plunged in tan : it is also coming nearer to nature, which should be always studied in the cultivation of plants, both in soil and situation. In tropical countries it is the sun that heats the earth in which the plants grow, not the earth that heats the air ; and the heat must be kept up in the stoves accordingly. If the house be heated by steam, no tan is required. The plants may be set on stages, or any way that is most convenient. Some of them may be planted out in the house, where they will grow in great perfection, and flower and ripen fruit ; but if grown in large pots, they will answer quite as well.”

In the construction of plant-stoves, it may be necessary to notice, that fewer openings for the admission of air are required than in any of the other plant-houses, for this reason, that the degree of heat, which must be always kept up within the enclosed atmosphere, is so much greater than that of the open air, that the difference of the specific gravity of the two fluids, when permitted to mingle by opening two or three sashes, produces a more active circulation, and sooner approaches to an equilibrium of temperature ; and, however numerous the openings in the roof or sides of such houses may be, they can seldom be made use of without reducing the house to too low a temperature ; and as the plants are for the most part kept in pots, and many of them being of slow growth, they are not

so apt to etiolate, or become drawn up slender, as those in the green-house or conservatory.

As there are many of the tropical plants in general cultivation that are climbers, and amongst them some of exceedingly great beauty, it is necessary that they be accommodated with proper means of supporting themselves. The most usual means are training them up the rafters, and some houses are furnished with wire trellises, as is the case with the house we have adopted for our plate. These trellises may be so arranged as to add considerably to the beauty of the house, when properly covered with plants, and so disposed as to form arches over the footpaths, and, occasionally, from one of the pillars which may support the roof of the house to another. However, too much scope should not be given to climbing-plants, however beautiful they may be, for, if carried to an extreme, it would occasion too much shade for the plants which occupy the middle of the house. The bed on which the plants are intended to stand, should be surrounded by a neat parapet wall, only a few inches higher than the surface on which the plants are to stand, serving to divide the bed from the walk or footpath, which should, as has been already observed, be made to surround the whole. If the house be to be heated by smoke-flues, they should be placed between the footpath and the walls of the house, so that any scorching heat may be prevented, as much as possible, from coming in too close contact with the foliage; a circumstance which often happens, and cannot be too securely guarded against. The house, of which our drawing is a representation, has two fires, which for its size are found sufficient. One of the flues enters at one end, and having passed along the front and ends, discharges its smoke in the back wall at the end farthest from the furnace. The other flue enters at the other end of the house, and makes three returns along the back wall, and discharges its smoke at the end farthest from its furnace. Spaces are left about a foot high between each flue, and they are all separated from the back wall by a vacuity of two inches, so as to present as much surface as possible for the escape of the heat. Upon the top of the third back flue, succulent plants are placed, and over the front one is placed a neat trellis, on which such plants are

placed that are not liable to be injured by the heated air. Often in winter, when the fires are kept up very strong, and powerful steaming resorted to, in order to counteract the effects of strong fire-heat, these plants are removed for a considerable distance from the end where the heat enters, and are disposed of in other parts of the house. The front parapet is found a convenient situation for placing small or handsome specimens while in flower, as they are there seen to greater advantage than when mixed in the general collection. In regard to plant-stoves heated by hot water, the pipes may either be placed exactly as the flues above described, as they occupy little space, or they may be placed under the footpaths, and covered with a neat ornamental grating of cast-iron. In placing hot water pipes under the foot-paths, accommodation can better be found for the reservoirs, than if placed above the floor-level. We have repeatedly expressed our opinion favorably to the hot-water system, and for the culture of stove-plants consider it of the utmost importance. In the cultivation of tropical plants, it does not often occur that they are planted out in the conservatory manner, as the rapidity of their growth, and the great size to which many of them attain, render this mode of culture unnecessary. The larger growing species are much better cultivated in large pots or tubs, and in these, specimens may be grown to a height sufficient for any house which has been yet erected in this country. The climbing species may, however, be planted out, as from their habits they can always be kept within due bounds by the pruning-knife, and seldom succeed well if not in very large pots, which may not be always conveniently disposed of in situations where they should stand. Although the majority of stove-plants are better cultivated in pots or tubs, than when planted out, it must be still acknowledged that the pots have not always the most agreeable appearance. In order to remedy this defect, without plunging them in the bed, which we would not advise, unless in cases of the most robust growing kinds, whose roots can sustain no injury by this mode of treatment, we would suggest the idea of covering them with moss, which may be always kept fresh by occasionally renewing it; but even this is not often necessary, as the humidity which a well-managed bark or moist

stove attains by daily watering, will be suitable to several species of that class of plants. Almost all mosses fit for this purpose prefer a damp shady situation; and it is surprising to see how luxuriantly some of them, that are natives of the regions of almost perpetual snow, will flourish in a moist stove, where the temperature is seldom below 60 degrees. Towards the front, where the sun has most influence, various species of *Cenomyce*, particularly *C. rangiferina*, will retain its natural colour for a long time, and form a beautiful contrast with the darker hues of those that are behind. Stove-plants require a great portion of water, and during winter much trouble and inconvenience will be occasioned, if provision be not made for having a supply of that indispensable element conveniently at hand; and as the water with which they are at all times to be supplied should be nearly equal to the minimum temperature of the house, a cistern should be so contrived as to have in it at all times an abundant supply. The most eligible situation for such a cistern, we presume, is over the furnace, in the shed behind, which should be supplied by a pipe from the reservoirs appended to the garden. Cisterns for this purpose may be of lead or cast-iron, as being always supplied with water accordingly as it is drawn off for use, cannot be injured if they be made of either material. A pipe with a stop-cock should be introduced from the cistern into the house, so that the cultivator may be supplied with the greater convenience; and as the fires are seldom extinguished during cold weather, a sufficient supply of warm water can be always readily obtained.

CONSTRUCTION OF THE DRY-STOVE.

In the construction of the dry stove, it is not essentially necessary that it be different from that which has been already described for the cultivation of moist-stove plants, further than that, instead of the bed on which the plants are placed in the latter, a stage be substituted in the former for their reception. The plants which form the great bulk of dry-stove collections are succulents, and many of them exceedingly slow in growth, some not attaining a greater height in a century than that of many moist-stove plants in the period of a month. Being

placed on stages, their characters are better exhibited to the spectator than if placed on a flat surface. It is not in character with the inhabitants of this structure to have creepers trained upon the rafters, for plants of so very opposite habits do not associate well together; and besides having an inharmonious effect, they produce another, which is injurious to their welfare. All tropical succulent plants are found naturally exposed to the full influence of the sun, and when imported into our northern latitudes, require all the sun-shine which we can admit to them, and this can never be fully admitted, if the foliage of creepers be allowed to intervene between them and the light.

The great merits, generally considered, of dry-stove plants are their eccentricity of forms, although some of them, particularly the *Cactus* genus, produce flowers, one of which, *C. speciosissima*, baffles the ingenuity of the most expert artist to imitate it, in respect to delicacy and richness of colouring. Many others are splendid while in bloom, but, for the most part, are very fugacious, seldom lasting many hours in perfection. The *C. Grandiflorus*, of which the annexed figure is an excellent reduced representation, has long been an inmate of our stoves and attracted notoriety, in consequence of its flowering during the night, and hence its English name, Night-flower of Cerrus or *Cactus*. The flower of this curious species begins to expand its bloom about eight o'clock in the evening, and is in perfection from ten to twelve, but, before day-light next morning, is fled for ever. The finest collection of this division of plants in this country is in the Royal Botanic Garden at Kew, where a large house is dedicated for their reception, and the mode in which they are cultivated reflects great credit on Mr. Bigby, the curator, who, for many years, has paid more than ordinary attention to their cultivation. There are, however, many plants that are correctly dry-stove plants, which are not of the succulent sorts, consisting of climbing, bulbous, herbaceous, and woody plants. In order to cultivate a complete collection of these plants in the first degree of excellence, it is necessary to have a separate division for each section, but this is seldom observed in practice; the majority of cultivators being content with two general houses, one especially for bark-stove plants,

and the other for dry-stove plants ; consequently, part of both divisions are not at all times properly treated, unless the cultivator be at much trouble in altering the mode of culture of certain species to suit existing circumstances. Dry-stove plants generally require an intermediate temperature between the green-house and bark-stove, and a much drier atmosphere than either, particularly the latter : they require always a great degree of light, and should consequently be kept near to the glass. Those which are succulents, require very little water, particularly during winter, and in all cases more harm may be expected from a too free application of that element, than an almost entire want of it.

STOVE AQUARIUM.

The great bulk of cultivated aquatics are either hardy, and capable of being cultivated in the open air, or they are so tender as to require the same temperature as stove or tropical plants. There are fewer examples of this kind of plant structures in this country, than of the other descriptions of houses already noticed, not but that they are very interesting in their way, and many of the plants which might be cultivated in them are extremely curious, beautiful, and interesting. The genus *Nymphaea* is exceedingly beautiful, and those of *Euryale*, *Nelumbium*, and many others, extremely curious, and that of *Oryza* and *Papyrus* highly interesting ; the former being the rice of commerce, and the latter the well-known *papyrus* of the ancients, the plant which furnished the materials on which the most ancient of all records were written, and to which we are indebted for our knowledge of events coeval with the great Jewish legislator. As examples of Tropical Aquariums, we may refer to those in the gardens of the Duke of Marlborough at White Knights, in which were cultivated for a considerable time a rich collection of these plants, but which, from causes of a private nature, is now discontinued. One of these houses may be described as being a span-roofed house, having the sides and ends also of glass as low as the top of the flues. Instead of the bed, or stage, in the other stoves, a large cistern is here substituted, having a walk round it.

In this cistern are cultivated the proper plants, some rooting in muddy rich soil placed on purpose in the bottom; others floating on the surface, which, like the genus *Lemna*, may be said to have no settled place of abode. A flue goes round underneath the bottom of the cistern, in order to keep the water of a certain temperature; while another flue goes round the house, for the purpose of heating the atmosphere of it: the bottom of the cistern in question is of slate, supported on iron bearers, over which is a covering of lead. Wood might have been used, had no fear of danger from the heat of the flues been apprehended. In a house of this description, the tallest growing aquatic plants might be exceedingly well cultivated; but for those of diminutive growth, and such as float only on the surface of the water, such as *Nymphæa*, &c., a house much less lofty, or indeed a neat pit would answer much better, for experience proves, that such plants require all the light and sun that it is possible to give them, and which can never be so completely effected if they be placed too far from the glass. Mr. Loudon, in *The Encyclopedia of Gardening*, proposes the following improvements in regard to Tropical Aquariums:—"A more perfect plan would be (alluding to the house at White Knights) to have the cistern close to the front glass, and to have that glass rather flat, say an angle of 15 degrees; or two cisterns might be formed, one in the back part of the house for tall plants, and the other in front for floating foliage, with a broad path between. But the most elegant plan would be," continues that intelligent writer, "to have a circular house, glass on all sides, to have a cistern in the centre for river plants, and a surrounding cistern for those which grow in stagnant water. To imitate the effect of the motion of water, in the central cistern, the mould, or pots in which the plants grow, might be placed on a bottom apart from that of the cistern, and this bottom being on the end of an upright shaft might, by the aid of proper machinery, in a vault below, be kept in perpetual circular motion. Those plants, which grow naturally in rapid streams, might be planted or placed on the circumference of the bottom, and those requiring less agitation towards its centre. If reversed motion were required to imitate tides,

(where marine aquatics were cultivated,) nothing could be easier than by the sort of wheel used in the patent mangle to produce it to any extent; or, by another still more simple plan, known to every engineer, it might be changed seldomer, say only once or twice in twenty-four hours. If a rapid and tortuous motion were required, then let the bottom on which the plants are placed be furnished with small circular wheels placed on its margin, working on pivots, and furnished on their edges with teeth like a spur-wheel. Then let there be a corresponding row of teeth fixed to the inside of the wall, or side of the cistern, into which they are to work like a wheel and pinion.

“By this means, pots of plants, set on the small wheels, will have a compound motion; one round the centre of the small wheels, and another round that of the large bottom. It may be thought by some, that the machinery would be intricate and troublesome, but the power requisite is so very small, that it might easily be obtained by machinery on the principle of the wind-up jack, such as was used by Deacon in his ventilating *Æolians*. This kind of machinery very seldom goes out of order, or requires repair, and no other attention would be necessary than being wound up twice in twenty-four hours, and oiled occasionally. The same vault that contained it might serve for the furnace or boiler,” if heated by steam.

PROPAGATION OF TROPICAL PLANTS.

Propagation is the first principle which should be acted upon in the formation of a collection of plants, and a strict attention to it annually is no less important after the collection is established, for the lives of plants are as uncertain as those of animals; and unless attention be paid to keeping up the stock by repeated propagation, many of the short-lived species will soon be lost. To keep up a collection in the first degree of excellence, it is necessary that a certain number of each species be annually propagated, as many of them become unsightly when old, and by increasing in size preclude the possibility of keeping so many individually. Some tropical plants, however, do not flower until they attain a considerable

size and certain age; but this is not generally the case, the majority will flower finer, and look much better, when about two or three years old than when kept longer. Small plants are more conveniently kept than large ones, and, by having a young stock always in readiness, there is little chance of losing any of the species.

Stove-plants, like most other plants, are propagated by a variety of methods, but are more often originated by seeds and cuttings than by any other. Few of them ripen their seeds in this country, but there is no difficulty in obtaining them from abroad, as the intercourse between this country and the East and West Indies, the Cape of Good Hope, and the islands in the South Seas, is so frequent. Many seeds introduced lose their vegetative principle from a variety of causes, and hence the frequent disappointments which occur to the cultivator. When seeds are not thoroughly ripened before they are gathered, or when they are packed up before properly dried, or when they are injured by the effects of moisture during the voyage, may be considered as some of the causes. To remedy these defects has occupied the attention of several eminent botanists; but the conclusions that they have hitherto drawn, do not appear to be completely satisfactory. Unripe seeds seldom germinate, because their parts are not yet prepared to form the chemical combinations on which germination depends. Some seeds retain their vegetative properties for many years, while others even commence vegetating before they quit the very seed-vessel; and, in the case of some fruits, it occurs even before the fruit is ripe, and while yet attached to the parent plant. Some others, if guarded from the effects of external air, will retain their living principle, from forty to probably one hundred years. Seeds of oats have been ascertained to have remained during the former period in a sound state, and have freely vegetated when the ground on which they were deposited was ploughed up. From the experiments of Ray and others, we learn that seeds will not vegetate if placed in a vacuum, but that the same seeds will grow when air is again admitted to them.

The enterprising Baron Humboldt found that the process of vegetation was accelerated by steeping seeds in water im-

pregnated with oxymuriatic acid, and this has been tried in the Clapton Nursery, in regard to accelerating the vegetation of the seeds of *Banksias*, and other New Holland seeds, that do not vegetate freely. There are other gases which have a different effect, namely, nitrogen gas, carbonic acid gas, and hydrogen gas, which, according the experiments of Archard, prevent the germination of seeds, unless mixed with a certain proportion of oxygen gas, which led him to conclude that the latter gas is necessary to the vegetation of seeds, and the only constituent part of the atmospheric air which is absolutely necessary for that process.

No seed will germinate at or below the freezing point, although placed in their proper soil, and hence seeds do not spring during winter. Heat and moisture are the principal agents for producing this effect, and whenever these are supplied, as a consequence, atmospheric air accompanies them.

As there is much difficulty in procuring seeds of some species from India in a state fit for vegetation, no time should be therefore lost in sowing them upon their arrival. The late Cushing, in regard to the season for sowing tropical seeds, observes, "As the spring is undoubtedly the best time for sowing, a few weeks delay may, in some instances, be advisable. If received late in October or November, wait till January, or perhaps February, unless it evidently appears that they will not keep out of the earth so long a time in a vegetative state. Those which can be sown before August, have a good chance to acquire sufficient strength of growth to carry them through the winter-months, so adverse to the general efforts of young vegetable life." On preparing the pots, mould, &c., and sowing the seeds, the same author continues:—"The pots being well drained, should be filled with the compost suitable to the species of plant of which the seed intended to be sown has been produced: let it be pressed down to about a third, or half an inch, below the rim, according to the size of the seeds; if they be small or light sorts, it will be necessary to press it pretty tight, and to add a little very fine sifted mould, on which to deposit the seeds, previously smoothing it with a bit of thin flat wood, bent so as to lie on it level. Being thus prepared, let the seed be sown regularly

on the surface, and cover it from about an eighth to a quarter of an inch, according to the size of the seed, as before, with the same sort of fine mould. But, if the seeds be of the largest sorts, as, for instance, the nut or stone kind, no more is necessary than to press them into the earth with the finger, and to cover somewhat thicker than is recommended for the others. In either case, the covering should be pressed moderately on the seed with the hand, which is indeed a most necessary caution in sowing seeds of any description whatever. In order to insure the vegetation of hard or very tough shelled seeds, some have them soaked in water for a few days, say a week, or even ten days, for those which happen to be very dry, previously to sowing: a shallow pan, placed on the coolest part of the flue in the propagating-house, is the readiest and safest article to receive them for this purpose; they should be examined daily, and sown the moment any swelling or growth appears; this process, however, is fraught with danger to many of the lighter and smaller sorts. The sowing being finished, the pots must be set on a level spot, and gently, but thoroughly watered with a pot; the rose of which has been made particularly fine, for this and other such uses, and immediately plunged into a strong heat, without which, they will not be likely to vegetate: if a close dung hot-bed the better. A regular but moderate watering, steady heat, and occasional weeding, should any weeds appear, is all that they will now require till they be fit to be removed into separate pots; which may be done as soon as they have attained a few inches growth above their colyledons, or seed-leaves. There are some fruits, such as *Nelumbium*, whose exterior coat is so very hard, that the embryo plants are not able to burst through, at least with us; to remedy which, the knife is not unfrequently used to pare them thin, even to making a hole in them, but not too near the eye or part where they sprout. If the business of seed sowing be performed in spring, or early in summer, the smaller sorts may be expected to vegetate in the course of five or six weeks at farthest; whereas the larger bony kinds will sometimes remain dormant in the earth for the space perhaps of twelve months; this must be attended to, else one might think them beyond the chance of growing, and perhaps throw them

away without examination. Whenever there is any doubt of their vegetating, let some of them be taken up, and opened with a knife; when they will at once discover whether they be sound or not; if sound, they must be still kept in a strong heat, and regularly watered as before; for want of this simple precaution valuable seeds are often carelessly thrown on the rubbish-heap, when just bursting their shell or embryo; and not unfrequently, by that accidental check, are so materially injured as to prevent more than one half of them vegetating again, if they have been at all so fortunate as to be noticed and resowed."

Sweet, writing on the same subject, observes, "When seeds are received from abroad, some of them should be sown immediately, whatever season it may be; for sometimes seeds will grow when first received, which will not if kept some months longer: but the general time of sowing should be early in spring, that the plants may get strong before winter. A gentle hot-bed is best for bringing up most of the tropical kinds, but some few will come up better on a shelf, or a flue of the hot-house. The sooner seedlings are potted off the better, as they do not miss their moving when potted off very young; but seedlings are not so hardy, nor so easily preserved, as plants raised from cuttings, and seldom make so good plants; from cuttings they have stronger roots, and a greater number of them."

PROPAGATING TROPICAL PLANTS BY CUTTINGS.

The propagation of tropical plants, by cuttings, is by far more generally adopted than rearing them from seeds. As we have already observed, seeds of such plants are not often perfected in our stoves, but cuttings can always be had in plenty from plants that are properly treated, excepting from those which do not produce shoots fit for the purpose; but even most of those are capable of being increased by other means, which will be noticed in the sequel. The season best calculated for commencing the operation of increasing by cuttings, depends more on the state of the plants intended to be operated upon, than upon any particular day, week, or month. It

may generally, however, be considered a rule to begin early in the year, that the cuttings may be rooted, and fit to pot off by April or May, by which means they will be fully established in the pots to stand the hot suns of June, July, and August, during which three months they will make rapid progress, and will, by the end of October, be, if properly treated, handsome plants.

In regard to the season of commencing propagating tropical plants, by our own practice it is to begin in February, and even in some cases in January, and finish by the end of March; and for this purpose we use a close pit, and often a garden or cucumber frame, wherein a brisk heat is constantly and uniformly kept up from the time the cutting-pots are plunged in it till the whole have rooted, and are fit to pot off. After which they are removed to a nursing-pit, and kept growing by being kept moist, and never below 70 degrees of heat, if possible.

The Author of the Botanical Cultivator gives the following as his practice, which has been very extensive as a commercial grower:—"For the propagating of stove-plants a small house should be appropriated; a north-eastern aspect is preferable to any other, so as to have the morning sun, and none afterwards: they then want no artificial shading; for the less sun cuttings have before they are rooted, and the more light, the better. A pit might be made in the house, and one part of it filled with fresh tan, another part with rotten tan, and a third part with mould. In the fresh tan might be plunged, under hand-glasses or bell-glasses, any cuttings of plants requiring heat: in the rotten tan, under bell-glasses, any kinds not requiring heat; and in the mould, under hand-glasses, large cuttings of green-house plants," as we have already noticed, "which require no heat. Cuttings, particularly of hard woody plants, root best in fine sand, and are safer to pot off after being rooted, as the sand shakes clean from their roots without injuring them. When planted in mould, the roots are apt to break off in parting them: but some of the herbaceous or soft-wooded kinds will not root well in sand, and must therefore be planted in mould. Cuttings must be put in when the wood is fit. Some kinds root

freely in either young or ripened wood; other kinds will only strike in very young wood, and others only in ripened wood. From Christmas till April may be considered as good a time as any to put in most kinds of cuttings, as they root more freely before the weather gets too warm; but some kind or other require to be put in every week throughout the year. No leaves should be taken off or shortened, except on the part that is buried in the ground, when the closer to the stem they are taken off the better. The more leaves a cutting has on it, the sooner it will root, though most propagators trim up their cuttings like a parcel of naked sticks, which is the very cause of their not succeeding. The shallower cuttings are put in the pots, they better they root, if they be but well fastened: if planted deep they are more likely to rot, or damp off; the sand or mould in which they are planted must be kept moist, but not too wet, and the glasses must be wiped occasionally; for too much moisture on them will make the cuttings turn mouldy, and rot off, even after they are rooted. When the young plants are rooted, the sooner they are potted off the better, in as small pots as they can be safely got into; for if too long in the cutting-pots, the sand is apt to injure their roots. When they are first potted off, they should be kept under a close glass for a few days, or in a frame on a gentle hot-bed, and shaded from the sun with a mat till they have taken fresh root: then harden them to the air by degrees. When the young plants are drawn up too slender, their tops should be pinched off, which will make them grow bushy. It is always best to top plants while young, if wanted to grow neat; if let run up high, the knife must be used, which causes a wound that sometimes is unsightly. No leaves should be taken off any plants except decayed ones, for it weakens them very much. Taking off a large leaf from a young plant will generally kill it; a circumstance that few cultivators are acquainted with."

Cushing, who was long a propagator in the Hammersmith nursery, has left us the following directions, which, although something lengthened, yet as it is different from our own practice, and also from that of the author last quoted, we will avail ourselves of the following extracts from his *Exotic Gardener*:

“The cuttings may be made almost every season of the year, yet the months of April, May, and June, are certainly the most proper, as the plants are at that season plentifully supplied with young wood, which, in most species, produce roots, when made into cuttings, much sooner than the old wood will if used in the same manner.” After detailing the manner in which the pots should be prepared for the reception of the cuttings, which is not different from what we have already noticed in treating of green-house plants, he proceeds: “On the purity and clearness of the loam depends, in a great measure, the success of many of the tenderer kinds of cuttings, particularly those that are obliged to be kept in a moist heat, as it is, when contaminated with other composts, very liable in these situations to cause damp and rottenness by the particles of putrifying matter generally contained in mixed earths, and the properties of which are put in motion by the application of heat. As an exception to this rule, may be adduced sand, which is of great utility to mix with loam, should it happen to be rather stiff, for the nature of the cuttings; but then the sand proper for this use is of so pure a nature in itself, that it is evident it cannot have the effect noticed above in regard to mixed soils.” In regard to the choice of cuttings, the following observations are also in some degree different from that which we have already noticed. In selecting cuttings, the same author observes, “preference should be given to the firmest wood, of the same year’s growth; and of these, only such whose leaves have attained their full size and proper colour, which are generally to be selected from the lateral shoots, as the upright leading shoots are mostly too luxuriant to make good cuttings. The cuttings of many plants, if taken from the lateral shoots, never become proper erect stems, but are inclined at all times to form an irregular, bushy, weak head: this is but of small importance to those collectors who cultivate plants merely for the flower, as such heads generally produce them sooner than luxuriant leaders. The lovers of handsome erect plants, however, choose their cuttings from the upright shoots early in the season, before they acquire that luxuriance of growth so unfit for the purposes of propagation. The tops of the shoots are to be preferred, unless they happen

to flag before used. To prepare them for insertion, most of the leaves must be trimmed off close to the stem, leaving only a few at the top, to allow a free respiration of air, so necessary to the life of the plant. This is a most essential article in the art of making cuttings, particularly those of evergreens; for if they be deprived entirely of their leaves, or that they otherwise flag, or occasionally fall off soon after they are put in, there will be little or no chance of their growing. The reason is obvious, because the inherent sap of the cutting being deprived of these organs of respiration that keep it in motion, and the cutting having no roots, by the efforts of which to produce new leaves, the sap consequently becomes stagnated in the pores of the wood; which, like the stagnation of the blood in animals, will, in all likelihood, prove mortal, by occasioning an immediate mortification." In preparing the cuttings, and inserting them, he observes: "In shortening each cutting to the most convenient length, care must be taken to do it with a clean cut, in a transverse direction, at a joint, and by no means should they be left exposed, or to lie any considerable time before planting. In planting, a small dibble, or other convenient instrument, should be used to press the loam sufficiently tight to the base of the cutting, as that is the principal part to be made fast. As soon as the whole are inserted, and the surface of the mould made level, and a little firm, give them a gentle watering to settle them; they should be left to soak about a quarter of an hour, and then covered with a bell-glass, which should be pressed pretty tight, so as perfectly to exclude the outward air. The atmospheric air being prevented by the glass from exhaling any of the juices of the plant, all its powers are forced downwards to produce roots, and these will soon prove their existence by producing young leaves and branches. If there be several cuttings of the same sort, they may be all put in one pot, unless they happen to be very large or curious sorts; but, in general, each species should be kept in a separate one, on account of the difference of time that some of them require to strike roots, and also that any scarce or valuable kind should be put only one in a small pot, as they are then not liable to be injured so much by damp, neither do they

require to go through the precarious operation of separate potting so soon after being struck. Should it be requisite to have a considerable number of cuttings made at the same time, it would be proper to have a one-light frame with close sashes, placed on a moderate hot-bed ready to receive them. It should be covered with saw-dust or clean tan, about a foot deep, in which to plunge the pots; but if there be only a few done, they may be plunged in any frame, amongst other things, provided there be a moderate heat." Many stove-plants strike so readily, that some cultivators put up a small hot-bed on purpose, which may be of the size of one or more lights, according to the number intended to be propagated; when this bed has come to a proper temperature, it is earthed over to the depth of a foot or fourteen inches, with the mould most congenial to the majority of the plants to be propagated. In this mould the cuttings are inserted pretty close together, and there they remain until rooted, when they are taken up and potted off in the usual manner. The principal feature of this method is, that the bed resembles what we may call one large pot, into which the cuttings are placed, the frame and lights being perfectly tight, act, as it were, in the place of a corresponding large bell or hand-glass; very little air is consequently given while the cuttings remain without root, but as these are formed, air is admitted gradually to them. All the while damp must be carefully guarded against, and all appearance of it removed when it occurs.

Dry-stove plants are propagated in the same manner, with the exception of such as are succulent. In regard to them, the cuttings or pieces of the branches should always have their top left uninjured, and none of the leaves removed where they exist, excepting such as would be inserted under the mould: such only should be removed, and that carefully, so as not to lacerate or wound the stem of the cutting. When the cutting is removed from the parent-plant, it should be laid by to dry for some days, more or less, according to its succulency; for if planted immediately after being separated from the plant, they would be apt to rot or damp off. Some species of these plants may, however, be planted as soon as taken off, but by

far the greater part will require this precaution, and may in some cases remain unplanted for a week or more. Those of this division of plants that make no side-shoots, like many of the *Aloes*, and some other genera, generally send up suckers from the roots, these should be taken off carefully, and when dried a day or two, planted at once into pots corresponding to them in size, &c. ; others send out offsets from their trunk or branches, which should be gently rubbed off, and treated like suckers ; some of them are, however, so short, as to admit of no part being inserted in the ground ; but such is the facility with which most of such plants reproduce themselves, that if they be only laid on the surface of the mould, and slightly fastened down, so as to prevent them falling off, they will emit roots, and soon fix themselves in the mould.

In regard to the management of tropical cuttings, while forming their roots, much attention is required. A steady brisk heat must be kept up, and attention paid to shading, watering, &c. On this part of their culture, Cushing makes the following observation :—“ They will now require the most particular attention as to watering and shading. The water must be given twice or thrice, very moderately, until the earth becomes sufficiently moist, which, if once so, will retain the moisture for a length of time by being covered with the glass ; but the shading is the principal care, whenever the sun’s rays fall on the glasses, as nothing will create rottenness sooner than letting the leaves flag, and lie upon each other, which will be the positive consequence of a want of shade. The most advisable method to obtain this end, is to have a few large sheets of strong paper to lay over the glasses within a frame, which, at the same time it shades the cuttings, does not prevent the sun’s rays from entering the frame, and clearing off any damp that may be accumulated therein, whereas, if mats be laid on the outside of the frame-light, it is evident they will tend to have the direct contrary effect. However, in the course of a week or a fortnight they will be able to withstand a little of the rays of the morning and evening sun,” and should afterwards be gradually accustomed to it until they can stand it with safety.

GENERAL CULTURE OF TROPICAL PLANTS.

Having so far enlarged on the propagation of tropical plants, we will now offer a few observations on their general culture.

As the majority of tropical plants are of rapid growth naturally, and rendered still more so by the close and high temperature in which it is necessary always to confine them, in a state of cultivation, it naturally follows that some are short lived, and many more are drawn up in the course of two or three years, so as to become naked at their bottom, and often very unsightly. Repeated propagation is the principal object to be had in view, so that as the older plants become either sickly, ill grown, or too large for the space allotted to them, they may be dispensed with, and their places supplied from the young stock. There is, however, this objection to that rule, that if the object of the cultivator be to have large and magnificent specimens, care must be paid to cultivate fewer in number, so as to afford sufficient room for them to extend themselves on all sides; and if sufficient room be allowed them in the pots or tubs, and abundantly supplied with water, and sufficient temperature kept up, most stove plants will attain a large size in a short period. Large specimens of these plants should be allowed a house for themselves, and a smaller house should be allotted for those of smaller growth.

WINTER TREATMENT OF STOVE PLANTS IN GENERAL.—
TEMPERATURE.

All plants are naturally subject, in a certain extent, to the vicissitudes of winter, spring, and summer, it follows, therefore, that, in a state of cultivation, something analagous should be followed by the cultivator in imitation of those changes. To keep tropical plants at a high temperature during winter, when there is little sun-shine, is to excite their growing principle at a period when they should rather be at rest; and where such a practice is followed, the plants become drawn up weak and leafless, in consequence of the perpetual, or we may say, in this instance, unnatural, stimulus to excitement, which the application of heat produces. It appears from practice and observation, that the temperature of the plant stove should be kept as

near to from 60 to 65 degrees as possible, during the dark days of winter, for all that is then required is to prevent the plants from being checked or chilled by cold during that season, so that, as spring naturally comes on, a farther, but gradual stimulus may be given them by additional heat, and most particularly during the day.

WATERING.

Water must not be entirely withheld, particularly from some species, but a much less quantity of it is necessary than when the plants are in a growing state, and able to decompose a greater portion of that element. Some species require none for several weeks together, and such may be ascertained by their habits of growth, and are of the herbaceous and bulbous sorts. As these naturally ripen their foliage in autumn (or at whatever other season), and appear to die down to the ground, they should be observed, and collected as near together as circumstances will admit of, and a suspension of watering should then gradually take place, and be continued in, till they begin to show signs of vegetation in spring, when they should be again supplied as usual. Some species which require very little water during winter, do not lose their leaves, nor die down to the surface of the pots; but it is only observation on the part of the cultivator, that can direct him in these instances when to water, and when to withhold it. It is (as we have repeatedly observed) one of those cases in horticulture for which rules may be laid down, but not wholly without exceptions, and must entirely rest on the judgment of the cultivator. Steaming the stove during winter is a material feature in the best management of such plants, and should be scrupulously attended to, both to soften the atmosphere of the house, as well as to prevent the increase of insects, particularly the red spider, which is sure to make its unwelcome appearance in a high and dry atmosphere. The most eligible time for steaming the house is in the evening, when the flues are hottest, and it is performed by pouring water on them, which generates steam readily. In time of very severe frost, this operation may be performed during the day, or dispensed with for a few days altogether.

The quantity of water required to produce a sufficiency of steam, depends on a variety of local circumstances, such as the size of the house, the way in which the water is put on the flues, &c. But it may be safely asserted, that more than is necessary is often used when it is poured on them by random, or done in too hurried a manner. In steaming all sorts of hot-houses, as well as in their whole management, it can only be expected to be well done when the operator feels an interest or pleasure in doing it. A few minutes more spent in applying it regularly and leisurely over the whole surface of the flues, will do much more good than sluicing a hogshead of water over the house in a careless manner.

VENTILATION.

During the winter months very little ventilation is required in these structures, for, unless the house be unusually well glazed, and in complete repair, a sufficiency of fresh air will find its way into it between the laps of the glass, and other openings. Indeed, greater care should be had to the exclusion of cold air during winter, than to its admission. The plants are, for the most part, (as observed above,) in an inactive state; and, therefore, not in want of those gasses which compose certain parts of atmospherical air, and which are found so necessary for them when in a growing state.

INSECTS.

The destruction and prevention of insects should be always before the eyes of the cultivator, who is ambitious of healthy and fine plants; during winter there are some species of them that make their appearance, or are probably permanently on the plants. Carefully examining plant by plant, and leaf by leaf, is the only sure and effectual method of getting rid of them; it is often objected that such a method is tedious, but let it be recollected that if so, it is sure, and time can better be spared during bad weather for this purpose, at this season, than at any other. Many boasted remedies have been puffed up for the total suppression and prevention of them, but when re-

duced to practice have been found of little avail. If any thing can be applied in a general way for this purpose, it appears to be one of those gasses, which are destructive to animal life, while, at the same time, it is not injurious to that of vegetables.

Insects are probably, in all cases, the effects of bad management, and the effects of disease more than the cause of it. When plants are well cultivated, and kept in a growing state, few insects appear to molest them; but whenever they become sickly, insects are sure to follow.

SUMMER TREATMENT OF TROPICAL PLANTS.—
TEMPERATURE.

Fire-heat cannot safely be dispensed with in most seasons before the end of May, and should be regulated according to the coldness or warmth of the weather. The temperature, however, should begin to increase above that specified for the winter season about the beginning of February, and should be progressively increased as the plants begin to shoot out, and as the sun gets higher in our horizon, from 60° to 65° , it should be gradually increased to 70° , 75° , and by the end of March, or the beginning of April, may stand by sun-heat at 80° , and by fire-heat at or about 75 degrees, at the time of doing up the fires for the last time at night. This additional heat is necessary to be kept very steadily, for nothing is so injurious to plants as sudden transitions from a high temperature to a cold one, or the reverse. It is also necessary, at the above periods, to increase the temperature as the plants are then beginning to grow, and should be supplied with every stimulus abundantly to enable them to make proper shoots, for without the shoots are freely grown, they cannot be expected to produce flower-buds nor handsome plants. It is at the setting out of the season that this is to be effected, and not afterwards. Not but that many plants will shoot out a second time after being checked in their growth by want of heat or other causes; but let it be remembered that, with by far the greater part of valuable plants, such wood is seldom

sufficiently ripened in autumn to produce flowers the succeeding season, or to produce them in the same season in perfection.

WATERING.

As the plants begin to grow, and the season advances, water must be supplied more liberally than hitherto, and if the plants be vigorous, and the pots have been properly drained previously to the plants being put in, then we may almost say that, with regard to the majority of the tropical plants in the moist stove, that they cannot scarcely have too much water supplied them. There are exceptions, and the chief of those are, sickly plants, succulent plants, such as have not begun to vegetate, and such as are naturally impatient of much moisture. As the days begin to grow mild, and the sun to have some influence, syringing the plants over head should not be neglected, both to refresh and clean the foliage, and also to create a moist soft atmosphere within the house. At first, this mode of watering should be moderately done with a fine cap on the syringe, so as to resemble dew more than rain, and should be performed in the mornings before the sun is full upon them; but, as the season advances, it should be given in a much greater quantity, and with a moderately coarse cap, so that the foliage may be thoroughly washed, and cleared of dust and insects dislodged from under the leaves, young wood, and other hiding places. Towards the end of April, the operation may be performed in the afternoon before the sun is fully off the house, and by the end of June, in the evening about six o'clock. This method of watering is not intended to be sufficient for the plants; for watering at the roots must also be attended to, as the plants may appear to require it, but not oftener. The water used at all times, in the early part of the season, should have stood some time within the house to equalize its temperature, or be rendered fit by the addition of water heated for the purpose. By the month of June the water from the cistern in the back-sheds, or under any other cover (except under ground), will be sufficiently warm. In watering over head, whether with the syringe, or otherwise,

during the heat of summer, and late in the spring, when the sun is then powerful, particular care should be taken that the operation be performed before or after the sun acts too powerfully on the house; for if done when it shines in full strength on the glass, the foliage would be liable to sustain serious injury. For the particles of water thrown on the plants form themselves into little spherules on the leaves, the surface of which spherules collect the rays of heat in a considerable degree, more or less, according to their convexity, and the consequence is, that the leaves will be burned into holes wherever the focus is formed.

VENTILATION.

As the season advances, ventilation must be increased; but before the beginning of June, it is seldom necessary that it be indulged in to any great amount, a few inches of the lights being opened during the middle of the warmest days in March and April will be sufficient. But care must be taken that the house be shut up before the sun goes off it, as by that means the temperature of the house would fall too low before the usual time of lighting the fires, and, consequently, the plants would either become chilled, or else the fires will have to be lighted sooner, in order to keep it up, and thus occasion a waste of fuel that might be much better saved; for as sun-heat is much better than fire-heat, the less of the latter that is used, and the more of the former that can be retained, the better. By the middle of June, a change of air may be more freely admitted, and during July, and part of August, more bountifully indulged in. By the beginning of September it should be reduced, and so gradually to the end of autumn.

INSECTS.

During the spring months, insects will be rapidly increasing in numbers, and at that period are most injurious to plants, by attacking the young shoots and leaves. The process of picking them off should be attended to on all proper occasions,

and if persevered in, will keep them under. The red-spider is easily subdued by brushing the flues over, when heated, with a mixture of flour of sulphur and water; but if the engine or garden-syringe has been sufficiently used, there will be little fear of its making its appearance. The aphides, or green fly, as well as the thrips, are destroyed by the well-known remedy of tobacco-fumigation, which should be had recourse to whenever it makes its appearance.

SHIFTING TROPICAL PLANTS.

Cultivators, for the most part, begin a general shifting or re-potting of their stove-plants about the middle or end of April. However convenient the practice of a general shifting may be, still it is subject to many objections. All plants do not require to be annually shifted, but are found to flower better when that operation is less frequently adopted. All plants, even in the same house, do not begin to vegetate at the same season; and, as the time when they begin to grow appears the most natural to supply them with fresh food, it therefore follows that they should be shifted only as they attain that state. However, having made these observations, we may detail the process for brevity's sake under this general head, and, according to our usual method, give the essence of the practice of others, as well as that of our own. On this subject, Cushing observes, "Being fully prepared, let a part of them be taken to the potting-shed together, that they may be no longer than necessary out of the stove: and, while these are shifting, the operation of turning the tan-beds should be proceeded with;" but there are few modern cultivators who now use tan, as we have already noticed. After detailing this process, which differs nothing in principle from what we have explained in the pine-stoves, (*see Forcing Garden,*) he proceeds, "In shifting the plant, the greatest nicety should be used not to injure the roots: because, if the roots, from a multiplicity of wounds, (which are more frequently lacerated than cleanly cut,) once become cankered, or contaminated in any manner, the branches must also be expected to suffer and

decay." In preparing the roots of the plants, previously to their being repotted, he justly reprobates an old and erroneous practice, long pertinaciously adhered to by cultivators of the old school, that is, "that of paring off the best part of the roots with a knife, that is the tips or ends of the fibres, which are undoubtedly the active agents in collecting the food for the stem, &c. Then, without ever loosening the remaining part of the ball, set in the new pot with a little fresh earth thrown loosely about it: as a matter of course they think it must be completely drenched or flooded from the water-pot; and lastly, to crown the whole, perhaps immediately set it in a pan of water, when, if they only took time to consider the mutilated state to which they have reduced the roots, it is impossible they could ever conceive them to be in a state fit to undergo such treatment with any kind of advantage. But it is the misfortune of many, who will not for a moment hesitate to undertake the care of tender and curious plants, as a matter easily understood, yet will not take the trouble of judging for themselves to follow the old tract of cutting and watering, the same, as they may have before seen practised on the hardiest geraniums or myrtles. Though the method may not seem to hurt some few kinds of strong freely growing plants, yet it never can be allowed as a proper mode of treatment for all plants indiscriminately, because they may happen to have a good portion of roots: indeed more plants have been destroyed by this practice than by any other particular part of the system of management which some so blindly follow. There are instances, however, wherein a knife is necessary to the roots, as well as the branches, viz. when they become broken, or otherwise contaminated, and also to such as are propagated by cuttings of the roots, as some species of *Geranium* may be, some *Mimosæ* also, and indeed any that are observed to produce suckers; in all such cases they should be taken off with precision, and a sufficiency left to support the parent, if considered worth preserving. In turning the plant carefully out of the pot, observe if the roots have perforated it in any part, so as to render it impossible to part them without breaking the one, or lacerating the other, in which case prefer the former as the slightest damage: however, when the ball of roots

is divested of its pot, let the broken tiles, or whatever substance be used in draining, be carefully picked out without tearing off the roots which may have grown amongst them; also any caked or mossy substance on the surface, which will come easily off with the fingers. Then proceed to loosen the earth, and matted roots by gently patting them on the side of the ball with the hand, or otherwise, so as to open the pores of the earth without cracking the roots: shake off any loose earth, and, having a proper sized pot ready prepared, put in a quantity of the fresh mould sufficient to raise the crown of the roots to about half an inch below the rim of the pot, on which set the plant, and add more earth, lightly shaking it in among the fibres: let the whole be pressed moderately tight, but not so as to render it hard in the least degree, nor by any means using a stick for this purpose, (another never-failing attendant on the former practice,) by which the roots are extremely liable to be torn or bruised; add mould sufficient to raise the surface level with the rim of the pot, as it will settle to a proper depth with watering, and smooth the whole off neatly with the hand." When the whole are re-potted in this way, they are immediately removed again into the stove, and, by shading and attention to watering, &c., are soon re-established to a growing state.

On the same subject Mr. Sweet, in his *Botanical Cultivator*, remarks, "In potting plants, care should be taken to drain the pots well with broken potsherds, or rough bits of turf; for nothing injures them more than letting them get sodden with too much wet. The best time to shift them into fresh pots is in spring, but some will require to be shifted again in autumn, to have them thrive well. The freely growing kinds cannot be well over-potted, if there be plenty of room for them in the houses; they will thrive and flower better for being in large pots. Others that are more tender, should be kept in as small pots as possible, as they may not get sodden and lose their roots."

Our practice has been to shift only such plants, and at such periods, as they may seem to require it, whether in spring, summer, winter, or autumn; and, having the pots either new or well cleaned and drained, pot them, without injuring the roots

as little as possible ; but, at the same time, reducing the ball, so that the pot may contain as little of the old exhausted mould as possible, which, having supplied the plant for some time previously, cannot possibly contain any store of sustenance for it in future ; and, if left undisturbed of any size, prevents a sufficient quantity of new matter being put in the pot for its future supply. Unless in the case of very delicate species, or tender-rooted sorts, there is much less danger in entirely reducing the ball and cutting out the decayed or broken roots, than there is evident injustice done them by re-potting with the balls almost entire, and only adding from a quarter of an inch to an inch of fresh mould round the roots, which is all that the plant has to support it ; the interior of the pot being filled with a hard ball of exhausted useless mould, in which no root will hardly live, far less prosper. By the latter method, plants of a large size may be well grown in comparatively small pots, as the whole body of mould is in a fresh state, and, consequently, fitted for the purpose it is intended ; whereas, by the former method, plants scarcely a foot in height we often see occupying a pot nearly as much in diameter. Nothing looks worse than small plants in large pots ; and, such is the case, that such plants never prosper.

REMOVING TROPICAL PLANTS OUT OF THE STOVE.

A very common practice exists amongst cultivators to remove a large portion of their stove plants into the green-house during the warmer weeks of our summers. So far this is beneficial to some of the plants, that it admits of them standing much thinner, and, consequently, enjoying much more air and sun-shine. But, in carrying this practice into execution, we would recommend that the hardier species be chosen to be thus set out. Many of the delicate kinds, particularly those from the warmer parts of the tropics, cannot be injured, but be much benefited by all the heat that they can have, even in our stoves, during summer ; and as air can be admitted, at least it should be admitted to them by opening the ventilators or sashes of the house, they will thereby enjoy a sufficiency of that element without removal at all. However, when the house is crowded,

those that are hardiest, as noticed above, may be taken out. In regard to some of the inmates of the dry-stove or succulent-house, the case is otherwise, many of them are found to do better and to flower much freer when set out during summer. This is particularly illustrated in the case of some of the *Cactuses*, which seldom flower, if not exposed either to the temperature of the green-house or open air for a considerable period of the summer. When the plants are so set out, an opportunity will be afforded of cleaning such as are infected with insects; and, for this purpose, the practice of Cushing may be adopted. "When the plants are set out in summer," says that author, "every part of the house should be well washed with strong soap lees, in which a little of the same tobacco as is used for fumigating has been infused, in particular all the joints of the wood work, and also whatever nail-holes, or other crevices, may happen to be therein; as, in those places, some of the species, more especially the white mealy bug, is much inclined to secrete itself for breeding.

AUTUMNAL TREATMENT OF TROPICAL PLANTS.— TEMPERATURE.

Towards the end of September, or beginning of October, the evenings will begin to get cold, and, in order that the stove plants may not experience any check at this time, when most of them are in full foliage, it will be necessary to resume the use of fire-heat. This may be commenced with by only lighting the fires in the evening, and thereby merely warming the flues, which will diffuse a mildness through the house, which, in damp weather, will, in particular, be of much importance to them.

To have tropical plants look well, the period of winter should be shortened as much as possible by artificial means, and this can only be attained by lengthening out the autumn, as it were, by an application of fire-heat, when that from the sun becomes insufficient; and again, by bringing on spring at an early period by the like means. Tropical plants, in general, sustain more injury from allowing them to be checked in growth at this

period, much more so, than by any reasonable degree of coldness in the house during winter; an almost total stop is put too suddenly to vegetation, and, as a consequence, the juices of the plants are stopped while in full vigour, become stagnated, and soon vitiated; disease follows, and insects immediately commence their attacks; besides, the wood of many of the shrubby kinds are not properly matured, or what is technically termed ripened; and either a similar circumstance follows, or the buds do not expand into flowers in spring, from being not fully matured in autumn. It is well known that a favorable autumn has a very material effect in ensuring a crop upon trees in the open air, and it must have exactly the like effect upon those trees or plants under glass.

WATERING.

As the growing season of the plants draws to a termination, the supply of water must also be gradually diminished; and care must now be taken that none of them sustain injury from an over-abundant supply of it. The plants set on the bed, as they will be considerably shaded, and at a distance both from the glass and also from the action of the heat from the flues, will require to be attended in this respect, as the water which they receive from the syringe may be sufficient for many of them, particularly such as have ripened their wood, and all that are naturally deciduous. Those on the kirbs, or over the flues, will now, however, have to be supplied with an additional quantity, as they, particularly the latter, will be liable to be dried up, as the temperature is kept up by fire-heat. Nothing is so injurious to stove plants during autumn and winter, as an injudicious application of too much water, for it not only stagnates at their roots, but is apt to chill the house too much, particularly towards the surface of the bed on which the plants stand. Steaming should again be commenced with, which is of itself a species of watering, and syringing should be persevered in, but with moderation. It should also be observed, that the water used both for syringing and also for application at their roots, should be placed in the house some hours previously to using, or otherwise warmed to nearly the minimum heat of the house.

VENTILATION.

As the cold weather approaches, ventilation should be lessened, both as the admission of air would tend to lower the temperature of the house, and also as the plants do not require so much of it at this season as hitherto. When from the heat of any warm days that occur, that opening the sashes may become necessary, it should only be for a short time, as the warmer the house is shut up at night, the less fire-heat it will require to maintain a proper degree of heat throughout the night.

INSECTS.

Insects, the almost constant attendants on tropical plants, will still require looking after. The means already proposed may be adopted, or others that may be more effectual may be devised by the cultivator; at all events, vigilance and repeated application are necessary to keep them under.

AN ENUMERATION
OF THE PRINCIPAL GENERA OF
HOT-HOUSE OR TROPICAL PLANTS.

WITH THE SOIL EACH GENUS THRIVES IN.

INCLUDING THE MODE OF PROPAGATION, WHETHER FROM
SEEDS, ROOTS, CUTTINGS, &c. &c.

Genera.	Soil.	Mode of Propagation
Abroma	Peat and loam	By seeds and cuttings.
Abrus	Loam and peat	By cuttings.
Acacia	Peat and loam	By cuttings, seeds, and cuttings of the roots.
Acanthus	Rich loam	By cuttings.
Achania	Loam and peat	{ Cuttings taken from the tips of the young shoots root freely.
Achras	Rich loam	Cuttings strike freely.
Achyranthus	Rich light loam	By seeds and cuttings.
Acrostichum	Decayed veget. matter	{ By seeds, which may be brushed off the backs of the fronds, and by dividing the roots.
Adansonia	Rich loam	By cuttings.
Adelia	Rich loam	Cuttings root freely.
Adenantha	Loam and peat	{ Large cuttings, with the leaves left on, root freely.
Adiantum	Decayed veget. matter	By seeds, or by dividing the roots.
Ægle	Rich loam	Cuttings of the ripened wood root freely.
Ærua	Light rich soil	By cuttings.
Æschynomene	Rich loam	By seeds.
Agava	Poor sandy soil	By suckers.
Aglia	Loam and Peat	{ Cuttings that are ripened at the base will root freely.
Ailanthus	Loam and peat	By cuttings of the roots.
Alanguim	Peat and loam	Cuttings root freely.
Aleurites	Rich loam	{ Cuttings of the ripened wood, having the leaf left entire, will root.
Allamanda	Rich light soil	By cuttings.
Aloe	Lime rubbish	By suckers, which are produced abundantly.
Alpinia	Rich sandy loam	By dividing the roots.
Alstrœmeria	Rich light soil	By seeds, and by parting the roots.
Alyxia	Sandy loam and peat	Cuttings of the ripened wood strike root.
Amaryllis	Rich light soil	{ By seeds, which are sometimes produced, and by offsets from the bulbs.

Soil.	Mode of Propagation
Amerimum . . . Rich loam	{ Cuttings with their leaves left entire will root freely.
Amomum Rich sandy loam	Same as <i>Alpinia</i> .
Amyris Loam and peat	Cuttings root readily.
Anacardium . . . Light loamy soil	Cuttings of the ripened wood strike root.
Anemia Decayed veget. matter	By seed, and dividing at the root.
Angelonia Light rich soil	Cuttings root freely.
Angræcum Turfy peat	By dividing the roots.
Anguria Light rich soil	By seeds and cuttings.
Anona Rich loamy soil	Cuttings of the ripened wood strike freely.
Antidesma Rich loam	By cuttings of the ripened wood.
Aphelandria . . . { Light turfy loam } { and peat }	Cuttings of the young wood strike root.
Aralia Rich loam	Ripened cuttings strike freely.
Ardisia Peat and loam	By seeds and cuttings.
Arca Light sandy loam	Only by seeds.
Aristolochia . . . Sandy loam and peat	Cuttings root freely.
Artabotrys . . . Sandy loam and peat	{ Cuttings of the ripened wood root freely in a brisk heat.
Atrocarpus . . . Rich loam	{ By cuttings of a large size, having their leaves entire.
Asclepias Light rich mould	Cuttings root freely.
Asplenium Decayed veget. matter	By seeds, and by dividing the roots.
Aspidium Decayed veget. matter	By seeds, and by dividing the roots.
Astrapæa Rich loam	Young cuttings root freely.
Atalantia Light turfy peat	Cuttings of the ripened wood root freely.
Averrhoa Sandy loam	Ripened cuttings strike root.
Avicennia Loam and peat	Ripened cuttings strike root.
Ayenia Rich light soil	Readily by cuttings.
Bactris Sandy loam	Only by seeds.
Bambusa Rich loam	By offsets.
Banisteria Sandy loam	Cuttings of the ripened wood root freely.
Barleria Rich loam and peat	Cuttings of the young shoots root freely.
Barringtonia . . . Loam and peat	Cuttings of the ripened wood root freely.
Bassia Light loam	Ripened cuttings root freely.
Bauhinia Rich loam	Cuttings of the half-ripened wood strike best.
Begonia Rich light soil	Readily by cuttings.
Besleria Light rich soil	Cuttings root very freely.
Bignonia Loam and peat	By cuttings, but not very readily.
Bixa Loam and peat	Easily by cuttings.
Blakea Peat earth	{ Cuttings of the ripened shoots root, but not very freely.
Blechnum Decayed veget. matter	By seeds, and by dividing the roots.
Bletia Turfy peat	Rapidly by dividing the roots.
Boeconia Rich light soil	By seeds, which ripen abundantly.
Boerhaavia Rich loam	Cuttings root freely.
Bombax Rich loam	Half-ripened cuttings root freely.
Bontia Loam and peat	By cuttings.

Soil.	Mode of Propagation.
Bouvardia	Loam and peat Cuttings root freely.
Brassavola	Light sandy soil With difficulty by parting at the root.
Brassia	Light sandy soil Readily by dividing at the root.
Brexia	Peat and loam { Cuttings of either the old or young wood root readily.
Bromelia	Rich loam By suckers, which are produced in abundance.
Brosimum	Loam and peat Large old cuttings only will root.
Brownea	Loam and peat Cuttings of the ripened wood root freely.
Brucea	Rich loam Cuttings of the ripened wood root freely.
Brugmansia	Rich loam and peat Cuttings of the young wood root freely.
Brunfelsia	Loam and peat By cuttings.
Bryonia	Rich light soil Young cuttings root freely.
Bryophyllum	Light sandy soil Cuttings root freely, as does also the leaves.
Bubroma	Light loam By cuttings.
Bucida	Loam and peat Cuttings of the ripened wood root freely.
Bumelia	Loam and peat Difficult to increase by cuttings.
Buonapartea	Parasitical.
Bursera	Rich light soil Cuttings of a large size root freely.
Burchellia	Loam and peat Half-ripened cuttings will root freely.
Butea	Loam and peat { Cuttings with their leaves uninjured will root in a brisk heat.
Cacalea	Light sandy loam Cuttings when partially dried root freely.
Cactus	Light sandy loam Cuttings when partially dried root freely.
Cadia	Peat and loam By cuttings.
Cæsalpina	Loam and peat { Difficult to increase. Sometimes the half- ripened wood will root in a moist brisk heat.
Caladium	Rich soil By the tubers of the root.
Calamus	Sandy loam Difficult to increase.
Calea	Rich soil Cuttings root freely.
Calenchoe	Sandy loam By the leaves.
Callicarpa	Loam and peat Cuttings of the ripened wood root freely.
Calophyllum	Turfy loam and peat Cuttings of the ripened wood root freely.
Calyptrium	Loam and peat Cuttings of the young wood root freely.
Cameraria	Loam and peat Readily by cuttings.
Canella	Loam and peat { Large cuttings of the old wood strike best with- out being deprived of their foliage.
Canna	Rich loam By seeds, and dividing the roots.
Capparis	Rich light loam Cuttings root readily.
Capavaria	Peat and loam Cuttings root readily.
Capsicum	Rich soil By seeds.
Carica	Loamy soil { Large cuttings not deprived of their leaves strike root in sand.
Carissa	Loam and peat Readily by cuttings.
Carolinæa	Rich loam { Cuttings taken off at a joint, and their leaves left entire, will root in heat.
Caryota	Sandy loam Managed like the other palms.
Cassia	Rich loam By seeds and cuttings.
Calalpa	Light rich loam Cuttings root readily.
Catasetum	Managed like the other orchideous plants.

	Soil.	Mode of Propagation.
Catesbæa	Turfy loam	By cuttings.
Cattleya	Managed like the other orchideous plants.	
Ceanothus	Loam and peat	By cuttings.
Cecropia	Rich loam	Large cuttings root in sand.
Cedrela	Loam and peat	By cuttings.
Cerbera	Loam and peat	Cuttings root freely.
Cheirostemon	Turfy loam	Cuttings of the ripened wood root freely.
Chioeocca	Loam and peat	By cuttings.
Chloranthus	Loam and peat	Readily by cuttings.
Chomelia	Loam and peat	Cuttings root freely.
Chrysophyllum	Sandy loam	Ripened cuttings will root in a strong heat.
Cicca	Sandy loam	{ Cuttings of a large size with their leaves entire will strike root.
Cinehona	Loam and peat	Cuttings of the ripened wood sometimes root.
Cissus	Rich light soil	Cuttings root freely.
Citharexylum	Loam and peat	By cuttings.
Clematis	Rich light soil	Young cuttings root freely.
Cleome	Light rich soil	By seeds, which ripen freely.
Clerodendrum	Light rich soil	{ Cuttings of the very young wood, as well as pieces of the roots, make young plants.
Clitoria	Loam and peat	Cuttings root freely.
Clusia	Light sandy loam	Readily increased by cuttings.
Coccoloba	Rich loam	By cuttings.
Codarium	Loam and peat	Ripened cuttings strike root.
Coffea	Rich loam	By seeds and cuttings of the ripened wood.
Coix	Rich soil	Seeds are plentifully produced.
Colbertia	Sandy loam	Ripened cuttings root freely.
Columnnea	Peat and loam	{ Readily increased by cuttings, but easily lost if too much water be given it.
Combretum	Loam and peat	Only by layers.
Commelina	Sandy loam and peat	By dividing the roots, and by seeds.
Conocarpus	Loam and peat	By cuttings.
Cookia	Sandy loam and peat	Cuttings of the ripened wood root freely.
Copaifera	Sandy loam	Cuttings of the ripened wood root freely.
Cordia	Loam and peat	By cuttings.
Cornutia	Loam and peat	By cuttings.
Costus	Loam and peat	By dividing the roots, and by seeds.
Cotula	Rich light loam	Cuttings root readily.
Crataeva	Loam and peat	By cuttings.
Crinum	Rich loam	By suckers at the roots, and by seeds.
Crossandria	Light rich soil	Cuttings root freely.
Crotalaria	Loam and peat	{ By cuttings of the young shoots, and some species by seeds.
Croton	Loam and peat	By cuttings.
Curatella	Sandy loam	Cuttings of the ripened wood root freely.
Curenligo	Loam and peat	By offsets from the roots.
Curema	Loam and peat	By offsets from the roots.
Cyathea	Decayed veget. matter	By seeds, and dividing at the root.

Soil.	Mode of Propagation.
Cyees	Sandy loam By knobs, which form round the roots.
Cymbidium	Sandy peat By parting at the roots.
Cynanchum	Peat and loam Cuttings strike freely.
Cyperus	Rich soil By dividing at the roots.
Dalbergia	Sandy loam Cuttings of the ripened wood root freely.
Dalechampia	Loam and peat By cuttings.
Daphne	Rich loam and peat Ripened cuttings will root in sand.
Dendrobium	Turfy peat By dividing at the root.
Dichondra	Peat and loam Cuttings root freely.
Dicksonia	Loam and peat By seeds, &c., like all other ferns.
Dillenia	Light loam { Ripened cuttings with their leaves entire root pretty freely, and seeds are occasionally procured from India.
Dimocarpus	Rich loam Cuttings of the ripened wood root freely.
Dioscorea	Rich loam By parting the roots.
Diplazium	Decayed veget. matter By seeds, or by dividing at the roots.
Dolichos	Light rich soil By seeds, and sometimes by cuttings.
Doryanthus	Rich loam { Sometimes suckers are obtained from old plants, but sparingly.
Dracæna	Rich loam Cuttings root pretty freely.
Dracontium	Rich loam By dividing the roots.
Duranta	Loam and peat By cuttings.
Echites	Loam and peat By cuttings.
Elægaus	Loam and peat Cuttings of the ripened wood root freely.
Elæocarpus	Loam and peat { Cuttings of the ripened wood root freely, and seeds may be obtained by assisting the impregnation.
Elæodendrum	Peat and loam Cuttings of the ripened wood root freely.
Elettaria	Rich sandy loam By dividing at the root.
Embryopteris	Sandy loam Ripened cuttings strike freely.
Ephelis	Light loam Cuttings of a large size root freely.
Epidendrum	{ Parasitic on other plants naturally; and are often grown here hung up in baskets filled with moss, &c.
Eranthemum	Rich light soil Readily by cuttings.
Eriodendron	Turfy loam Readily by cuttings.
Eriolæna	Turfy loam Half ripened cuttings root freely.
Erythrina	Rich loam Cuttings of the plant root freely.
Eugenia	Peat and loam Ripened cuttings root readily.
Euphorbia	Sandy loam { Cuttings partially dried will root, and many of the species ripen seed.
Euryale	An aquatic Seeds may be obtained by assisting impregnation.
Fagara	Loam and peat By cuttings.
Ficus	Rich loam { By cuttings, and some of the species will emit roots from the leaves.
Flacourtia	Loam and peat Cuttings will root freely.
Flemingia	Loam and peat Cuttings will root freely.
Flindersia	Turfy loam By cuttings.
Gærtnera	Loam and peat Readily by cuttings.

	Soil.	Mode of Propagation.
Galega	Loam and peat	By seeds and cuttings.
Galipea	Light loam	Cuttings root freely.
Galphimia	Turfy loam and peat	Ripened cuttings root readily.
Garcinia	Light loamy soil	Ripened cuttings will root in sand.
Gardenia	Loam and peat	Half-ripened cuttings strike root.
Gaya	Loam and peat	Half-ripened cuttings root freely.
Geoffroya	Loam and peat	Cuttings will root readily.
Gesneria	Light rich soil	By cuttings.
Getonia	Loam and peat	By cuttings.
Globba	Loam and peat	By dividing them at their roots.
Gloriosa	Loam and peat	} Readily by dividing the roots, or by seeds, which ripen abundantly.
Gloxinia	Turfy loam and peat	
Glycine	Loam and peat	Cuttings of the young wood root freely.
Gmelina	Loam and peat	By cuttings.
Gomphia	Sandy loam and peat	By cuttings.
Gomphrena	Rich light soil	Young cuttings root readily.
Gonolobus	Loam and peat	By cuttings.
Goodyera	Vegetable matter	By suckers.
Gossypium	Rich light soil	Half-ripened cuttings root freely.
Gouania	Loam and peat	Ripened cuttings root readily.
Grewia	Loam and peat	By cuttings.
Griffinia	Rich loam	By offsets from the bulbs, or from seeds.
Grislea	Loam and peat	Young cuttings root freely.
Gronovia	Rich loam	Young cuttings root freely.
Guatteria	Loamy soil	Cuttings of the ripened wood root freely.
Guazuma	Loam and peat	By cuttings.
Guilandina	Loam and peat	By cuttings.
Gustavia	Peat and loam	Ripened cuttings root in sand in a strong heat.
Hæmatoxylon	Loam and peat	By cuttings.
Hamellia	Loam and peat	By cuttings.
Hedychium	Light rich soil	} Dividing the roots is the mode by which they are increased.
Hedysarum	Loam and peat	
Heliconia	Peat and loam	By dividing at the roots.
Heliocarpus	Loam and peat	Cuttings root freely.
Hemionites	Decayed veget. matter	} By seeds, and by dividing at the roots, as all other ferns.
Heritiera	Sandy loam	
Hernandia	Sandy loam	} Ripened cuttings, with their leaves entire, root freely.
Heynea	Loam and peat	
Hibiscus	Peat and loam	} Several species ripen seeds, by which young plants are obtained, and others are readily propagated by cuttings.
Hillia	Peat and loam	

Soil.	Mode of Propagation.
Hippomane ... Loam and peat	{ Cuttings of both old and young wood will root freely.
Hirtella Loam and peat	By cuttings.
Hoffmanseggia Peat and loam	Half-ripened cuttings root freely.
Hoya Sandy loam	{ Cuttings root in heat; and young leaves stuck in the ground will also form plants.
Hura Light loam	Cuttings of the ripened wood root freely.
Hymenæa Loam and peat	By cuttings, but more readily by seeds.
Ichnocarpus ... Loam and peat	By cuttings.
Indigofera Peat and loam	By cuttings and seeds.
Inga Loam and peat	Young cuttings taken off at a joint root freely.
Inocarpus Loam and peat	Ripened cuttings root freely.
Ipomœa Rich light loam	{ Young cuttings root freely, and seeds are often produced.
Ixora Sandy loam and peat ..	Cuttings root freely.
Jacaranda Loam and peat	Half-ripened cuttings root freely.
Jacquinia Peat and loam	Cuttings root freely.
Jasminum Loam and peat	By cuttings.
Jatropha Loam and peat	By seeds, which often ripen, and also by cuttings.
Jussieua An aquatic	Easily propagated.
Justicia Peat and loam	Cuttings root freely in most of the species.
Legerstrœmia Peat and loam	By cuttings, which root freely.
Lagetta Loam and peat	Readily by cuttings.
Lantana Loam and peat	Cuttings root freely in fine sand.
Laurus Rich loam and peat	{ Cuttings of the ripened wood strike root, but not without care.
Lawsonia Loam and peat	Readily by cuttings.
Leea Light loam	Readily by cuttings.
Limonia Loam and peat	Cuttings of the ripened wood root freely.
Lisianthus Loam and peat	Readily by cuttings.
Lobelia Light rich soil	Cuttings strike freely.
Lonchitis Decayed veget. matter	By seeds, and dividing at the roots.
Lygodium Decayed veget. matter	By seeds, and dividing at the roots.
Macrocnemum Loam and peat	Cuttings root freely.
Mæsa Loam and peat	By cuttings, which root freely in heat.
Malpighia Peat and loam	Ripened cuttings will strike root.
Mammea Sandy loam	{ Ripened cuttings, with the leaves left entire root pretty freely.
Mangifera Sandy loam	{ Seeds are often imported from the West Indies which vegetate readily, but it may be also increased by cuttings in a moist heat.
Marauta Rich soil	By dividing at the root.
Marica Loam and peat	{ By seeds which ripen frequently, and also by dividing at the root.
Melaleuca Sandy peat and loam ..	Cuttings root pretty freely.
Melastoma Sandy peat	Young cuttings root readily.
Melhaunia Loam and peat	By cuttings, which root freely.

	Soil.	Mode of Propagation.
Melia	Loam and peat	{ Seeds often ripen, and cuttings will strike, if not too young.
Melicocca	Light loam	By cuttings.
Melodinus	Loam and peat	Cuttings strike root readily.
Michelia	Loam and peat	{ Ripened cuttings root freely, and it also takes if inarched on the <i>Magnolia purpuria</i> .
Mimosa	Peat and loam	{ Some species ripen seeds, and others are increased by cuttings.
Mimusops	Loam and peat	Ripened cuttings root readily.
Mouelia	Loam and peat	By cuttings.
Morinda	Loam and peat	By cuttings.
Muntingia	Loamy soil	Readily by cuttings.
Musa	Rich loam	Readily by suckers.
Mussænda	Loam and peat	Cuttings will root freely.
Myginda	Loamy soil	By cuttings.
Myrodia	Light rich soil	By cuttings of the young wood.
Myrtus	Rich light loam	{ By layers, although some of the species will root by cuttings. Seeds, when they can be obtained, are to be preferred.
Nauclea	Loam and peat	By cuttings.
Nelumbium	An aquatic	{ By dividing the roots, but more abundantly by seeds.
Neottia	Turfy peat	Only by dividing the roots.
Nephelium	Rich loam	Cuttings root freely.
Nephrodium	Decayed veget. matter	{ By seeds, and by dividing at the root, like all other ferns.
Nerium	Peat and loam	Cuttings root freely.
Nissolia	Loam and peat	Cuttings root freely.
Nyctanthes	Loam and peat	Half-ripened cuttings readily strike root.
Nymphæa	An aquatic	By dividing the roots.
Ochna	Loam and peat	By cuttings.
Ochroma	Loam and peat	Cuttings root freely.
Oldenlandia	Rich loam	Cuttings root freely.
Olyra	Rich loam	By dividing the roots.
Omphalea	Loam and peat	{ Cuttings having the leaves left entire root readily.
Oncidium	Parasitic	By dividing at the roots.
Ormosia	Loam and peat	{ Seeds are often procured from the West Indies by which they are increased; it will, however, also strike from cuttings.
Ornithrophe	Light loam	Cuttings root readily.
Osbeckia	Peat	Cuttings of the young shoots root freely.
Oxyanthus	Sandy loam and peat	Readily by cuttings.
Oxystelma	Loam and peat	By cuttings.
Pæderia	Loam and peat	Cuttings root readily.
Panax	Loam and peat	Readily by cuttings.
Panocratium	Rich loam	{ By seeds or suckers, which are almost annually produced.

Soil.

Mode of Propagation.

Pandanus	Rich loam	} The only means of increase in this country appears to be from suckers, and these are not often produced.
Parkinsonia	Loam and peat	
Passiflora	Rich loam and peat	} Cuttings, and if attention be paid to assist impregnation, new and curious hybrides may be produced.
Paullinia	Loam and peat	
Pavonia	Light soil	Cuttings root freely.
Pedilanthus	Light sandy soil	} Cuttings root freely, if put into the bark-bed instead of mould.
Peliosanthes	Turfy loam	
Pentapetes	Light rich soil	Cuttings readily root.
Periptera	Light rich soil	Cuttings of the young wood root freely.
Persea	Turfy loam	Generally by layers.
Petiveria	Light rich soil	Cuttings root freely.
Petræa	Loam and peat	Cuttings root freely.
Pharus	Light loam	By dividing at the root.
Phœnix	Rich loam	} From seeds only. The dates of the shops often vegetate, and, by that means, <i>P. dactylifera</i> , is increased.
Phrynium	Rich loam	
Phyllanthus	Loam and peat	By cuttings.
Phylloma	Sandy loam	Only by suckers.
Phytolacca	Loam and peat	By seeds and cuttings.
Pieramnia	Loamy soil	} Cuttings of a large size root better than such as are small.
Piper	Loam and peat	
Piscidia	Sandy loam	} Cuttings are sometimes rooted, by which plants are obtained.
Pitcairnia	Sandy loam	
Plukenetia	Light rich loam	By cuttings.
Plumbago	Peat and loam	By cuttings.
Plumeria	Light rich soil	Cuttings of a large size root best.
Poinciana	Loam and peat	By seeds.
Polypodium	Any light soil	} Multiplied, like all ferns, by seeds, and by dividing at the roots.
Pongamia	Loam and peat	
Pontederia	An aquatic	By dividing at the roots.
Polyspora	Loam and peat	Half-ripened cuttings root readily.
Portlandia	Loam and peat	} Cuttings, having their leaves left entire, root best.
Pothos	Light turf soil	
Prestonia	Loam and peat	Cuttings root freely.
Priva	Loam and peat	Cuttings root freely.
Psidium	Rich loam	} By layers, but will also root from cuttings, which produce the best plants.

	Soil.	Mode of Propagation.
Psychotria	Loam and peat	Cuttings root readily.
Pteris	Any light soil	By seeds, or by dividing at the roots.
Pterocarpus	Light loam	} Cuttings, having their leaves left entire, root freely.
Pterospermum	Rich loam	
Quassia	Loam and peat	Cuttings of the ripened wood root freely.
Quisqualis	Peat and loam	Cuttings root freely.
Rajania	Rich loam	By dividing the roots.
Randia	Loam and peat	Cuttings root freely.
Rauwolfia	Loam and peat	Cuttings root freely.
Rhapis	Sandy loam	By suckers from the roots.
Rhexia	Sandy peat	Cuttings of the young wood root freely.
Rhipsalis	Sandy loam	Readily by cuttings.
Rhopala	Sandy loam	Cuttings strike root freely.
Richardsonia	Loam and peat	By cuttings.
Rivina	Loam and peat	By seeds or cuttings.
Robinia	Peat and loam	By seeds or cuttings of the young wood.
Rolandra	Rich light loam	Readily by cuttings.
Rondeletia	Loam and peat	Cuttings root freely.
Roscoæa	Turfy loam	By dividing at the root.
Roxburghia	Loam and peat	By dividing at the root.
Rubus	Light rich soil	By suckers, cuttings, or seeds.
Ruellia	Light rich soil	By cuttings.
Ruizia	Peat and loam	By cuttings.
Russelia	Light rich soil	Readily by cuttings.
Sabal	Sandy loam	Occasionally by suckers.
Saccharum	Rich loam	By suckers.
Sagus	Sandy loam	Occasionally by suckers.
Salvia	Peat and loam	Most readily by cuttings.
Samyda	Loam and peat	By cuttings.
Sansevieria	Sandy loam	By suckers.
Santalum	Light loam	By cuttings.
Sapindus	Loam and peat	Large cuttings root more freely than small ones.
Sapium	Loam and peat	By cuttings.
Sarcoccephalus	Turfy loam	By cuttings freely.
Schinus	Peat and loam	Ripened cuttings root freely.
Sehotia	Peat and loam	By cuttings, but not readily.
Scopolia	Loam and peat	By cuttings.
Secamone	Loam and peat	Cuttings root readily.
Securidaca	Loam and peat	Cuttings root freely.
Selloa	Light rich loam	Cuttings of the young wood root very readily.
Seriana	Sandy loam	By cuttings.
Sesbana	Loam and peat	By cuttings.
Sida	Peat and loam	} As seeds of them are often produced in this country, young plants are easily obtained.
Siderodendrum	Peat and loam	
Sloanca	Loam and peat	Ripened cuttings root freely.

Soil.	Mode of Propagation.
Solandra.....Peat and loam.....	{ Most readily by cuttings, either of the young or old wood.
Solanum..... Peat and loam.....	Cuttings.of most of the species strike freely.
Sophora Peat and loam.....	By cuttings.
Spermacoce ... Peat and loam.....	By cuttings.
Spilanthes ... Rich light soil	Either by seeds or cuttings.
Spondias Loam and peat	{ Large pieces of the shoots made into cuttings, root freely.
Stachytarpheta Rich soil.....	Cuttings strike root freely.
Stapelia Lime rubbish	{ Cuttings root most freely, but require to be partially dried before planting.
Starkea..... Peat and loam.....	By cuttings.
Stelis Turfy peat	By dividing them at the roots.
Sterculia Light loam	Cuttings of the ripened wood root freely.
Stilago..... Light loam	By cuttings.
Stillingia Loam and peat	By cuttings.
Strelitzia..... Light sandy loam	{ Seeds are obtained by assisting the impregnation, from which plants are obtained, and rooted suckers are often to be had from the old plants.
Strophanthus.. Peat and loam	Cuttings of the young wood root freely.
Swietenia ... Peat and loam	Ripened cuttings root, but not freely.
Tabernæ- montana }	Loam and peat.....By cuttings.
Tacca Peat and loam	By suckers from the roots.
Talinum..... Sandy loam	Cuttings root freely.
Tamarindus .. Loam and peat	By cuttings and seeds, which are often imported.
Tecoma Rich loam	{ By cuttings of the roots, and by cuttings of the young wood.
Tectona Loam and peat	Ripened cuttings root freely.
Terminalia... Sandy loam	Ripened cuttings root freely.
Tetranthera ... Light loam	Cuttings of the ripened wood root freely.
Theobroma... Light rich soil	By cuttings.
Theophrasta .. Sandy loam	Cuttings, with their leaves entire, will root freely.
Thunbergia. .. Loam and peat	Readily by seeds and cuttings.
Tillandsia ... Parasitical	By suckers.
Tournefortia .. Rich loam	Cuttings root freely.
Tradescantia .. Sandy loam	By seeds, and by dividing at the roots.
Trevirana ... Sandy loam	By dividing the roots.
Trewia Loam and peat	Cuttings root freely.
Trichilia..... Loam and peat	Cuttings root, if kept in a good heat.
Triopteris ... Sandy loam and peat ..	Ripened cuttings will root readily.
Triphasia ... Turfy loam	Half-ripcned cuttings root freely.
Triumfetta... Loam and peat	By seeds and cuttings.
Turnera Light loam	By seeds and cuttings freely.
Unona..... Light loam	Ripened cuttings root freely.
Urania Rich loam	{ By seeds, which are often imported, and it will sometimes produce suckers.

Soil.	Mode of Propagation
Urena Loam and peat	By seeds, and also by cuttings.
Uvaria Sandy loam	Ripened cuttings strike root in a good heat.
Vanda Parasitical	By cuttings.
Vanguiera Sandy loam	By cuttings.
Vanilla Parasitical	Readily by cuttings.
Verbesina Loam and peat	By cuttings.
Vinca Peat and loam	By cuttings.
Vitex Peat and loam	By cuttings.
Volkameria Loam and peat	Cuttings root readily.
Waltheria Loam and peat	Cuttings strike root freely.
Witheringia Loam and peat	Propagated by cuttings of the young wood.
Wrightia Peat and loam	By cuttings of the half-ripe wood.
Xanthochymus Light loam	Half-ripened cuttings succeed best.
Ximenia Loam and peat	By cuttings.
Xiphidium Loam and peat	By dividing at the roots.
Xylopia Sandy loam	Ripened cuttings succeed best.
Zamia Sandy loam	{ Some of the species by dividing at the root, and others by small knobs which grow on the principal roots.
Zanthoxylum Sandy loam	
Zingiber Loam and peat	By dividing them at the root.
Zizyphus Loam and peat	By cuttings.
Zornia Light rich soil	By cuttings.

NURSERY AND PLANTING.

INTRODUCTION.

THE term nursery, when applied to matters relating to horticulture, is understood to refer either to the commercial or public nursery, wherein are cultivated trees, plants, and oftentimes seeds, for the purpose of sale; or to the private nursery, in which trees and plants are propagated and reared by the proprietor, for the purpose of enriching or beautifying his park or domain, or for extending his plantations with a view to ultimate profit, and increasing the value of his estate. The spirit for planting has very much increased in this country within the last sixty or seventy years; and we find during that period, that the minds of men conspicuous for their learning, and admired for their virtues and patriotism, have been enthusiastically attached to this pursuit, and the beneficial effects of their labours are, and will remain, monuments of their good policy, long after they themselves have "reached that bourne from which no traveller returns."

The beneficial effects of planting have long ago been sufficiently demonstrated to be attended with a certain and progressive increase of any given capital employed in it, and considered either individually or generally, must, in most cases, reward the speculator, although at a more remote period, with a far more certain return than almost any other speculation in which he can embark. Considered as a national advantage, planting must rank high in the list of improvements, and be indispensable in such countries as our own, the glory and independence of which depend so much on the strength of our navy and extension of commercial shipping. Our boasted oaks have been the envy and dread of our enemies, and the bulwarks of our safety, when invasion was threatened by the combined powers of almost the whole of

Europe. We are informed by Evelyn, the celebrated author of *Sylva*, that the commanders of the Spanish Armada had positive directions, that if, when landed, they should not be able to conquer this country, they were not to leave a tree standing in the forest of Dean, thinking that, by destroying that national forest, to weaken our maritime means of defence, and render us an easier prey to a future invasion. Britain has always been plentifully stocked with timber, and abounded, till the time of the civil wars, with natural forests of great extent; for we learn, at the time of the compilation of *Doomsday-Book*, that timber was not valued by measurement or quality; but the forests by the number of swine that could be maintained on the acorns and mast which they produced. And a writer in the time of Edward the Fourth, about four hundred years after that period, says, that England was then a well-timbered country.

It does not appear that previously to the beginning of the seventeenth century that planting was much attended to as a matter of rural economy, although it is certain that, for particular purposes, and in certain situations, a considerable number of trees must have been planted long before that period. Between 1538 and 1616, we meet with several authors on the subject of planting, and the management of forest and copse-woods; and, as an anecdote connected with the horticultural literature of this country, we may be excused for the following digression.

In 1538, Benose published a work on timber and planting, which was followed by another by Fitzherbert, in 1539; and in 1607 appeared Sir John Norden's *Surveyor's Dialogue*. In 1612 was published, "Of planting and preserving of timber and fuel, an old thrift newly revived by R. C.;" and in 1613, the year following, that by Arthur Standish, entitled, "Direction for planting timber and fire-wood." In Googe's *Husbandry* of 1614, Planting for timber and copse is particularly noticed; and Manwood's "Treatise on Forests, and their original and beginning," appeared in 1615; and that of Rathbone's *Surveyor* in 1616. At so early a period it is something singular, says an intelligent writer, there should appear so many works on a subject then so little generally

attended to. Professor Martyn conjectures this circumstance to have arisen from the general attack made on the forest-trees in the twenty-seventh year of Henry the Eighth, when that monarch dispersed the religious houses, and seized on the church lands; for after this time, we find the consumption of oak timber to have greatly increased, not only in consequence of the extension of commerce, but of the great additions to the royal navy, and the more general adoption of that timber in the building of houses, &c. For as Holinshead, who lived in the succeeding reign, observes, "in times past, men even were contented to live in houses built of sallow, willow, &c., so that the use of oak was in a manner dedicated wholly unto churches, religious houses, princes' palaces, navigation, &c., but now nothing but oak is any where regarded."

The publication of Evelyn's *Sylva* may be considered the grand impetus which exhibited a spirit for planting in this country, and the establishment of forest-tree nurseries which followed (during the seventeenth century), as a matter of course facilitated its progress, the most antient of which, it may be observed, was that of Corbett, at Twickenham, and that of Loudon and Wise, at Brompton Park, which is still so respectably kept up. Individuals about this period saw the advantage of planting, and, breaking through the trammels of ignorance and sloth, commenced planting timber-trees, many of which still exist as monuments sacred to their memory. Before the establishment of nurseries, as above stated, such trees as were planted were procured from the natural forests and woods, and were those which accidentally sprang from seed.

The encouragements held forth by the Society of Arts, which was established about the middle of the eighteenth century, contributed in a very important degree to promote a spirit for planting and the improvement of landed property. This planting became fashionable, and being noticed and patronized by the great, soon made rapid strides in improvement. The appearance of the *Sylva*, edited by Dr. Hunter, became a second stimulus; and the examples and precepts of Kennedy, Young, Marshall, and Pontey, as authors and practical men, together with the encouragement from such men as the Dukes

of Argyle, and Athol, Earls of Haddington, Bute, Loudon, &c., and latterly from almost every country gentleman both in England and Scotland, that planting has now attained a position amongst the liberal sciences, that renders it a pleasing, profitable, and honourable employment to the great, and a source fraught with considerable advantages to the poor, whose state is ameliorated by the employment it affords, and the means of affording not only comfortable dwellings, but also abundance of fuel, which is sufficiently appreciated in those countries, where coal is either dear or not to be obtained. The effect which planting has in the improvement of our climate is sufficiently obvious to the most superficial observer, and the improvement of the general appearance of the surface, in a picturesque point of view, cannot but awaken pleasing associations in the mind of every man, who is not, like the great lexicographer, predetermined to hate every thing vegetable, and who can travel from Dan to Bersheba without once seeing beauty in a single tree.

Agriculture is improved by the shelter afforded by plantations both to the cattle and grain crops, and evidently derives much assistance from the facility which they afford of subdividing property and fields. Architecture, both civil and military, has never to dread a want of materials, while that spirit is fostered and promulgated; but a neglect of it would be fatal to both, and the effects of a decay in our maritime power, would, in all probability, end in the subjugation of our freedom as a great and free people, and probably the blotting out of our name as the greatest of all nations.

FORMATION OF A FOREST-TREE NURSERY.

Proprietors who intend to improve their estates by planting, should, and many have proved the truth of the assertion, rear their own timber-trees from seeds, upon their own property, if their intention be to plant extensively, not only as an object of economy, but also as a matter of convenience. This doctrine has met with the most strenuous opposition, and many discouraging obstacles have been held out to those who purposed to adopt it. But it should be remembered that that op-

position was made by those, who considered their own private interests and emoluments to be at stake. Times are now much changed, and men see, and are disposed to act more liberally in this respect; and we find most of our great planters originating their own trees for their own use, notwithstanding that they can be, in many cases, purchased cheaper from the commercial nurserymen than they can be reared by the proprietor. This was not the case twenty or thirty years ago, and at that period, a vast annual sum passed from the hands of the planter to the nurseryman; and, as a consequence which might be expected, opposition and party-spirit followed, and in the end trees could be purchased at nearly 50 per cent. cheaper than they were formerly sold for.

This may be attributed to a class of needy men, who, taking the advantage of the planting mania, established themselves over the country, and by underselling the regular and respectable nurserymen, who had both credit and honor at stake, reduced the confidence of land-owners in them to that ebb, that for a time lands were planted by those who presented the lowest estimate. A system of this description was productive of both good and evil, for, in the first place, it acted as a stimulus to the more expeditious propagation of trees, and consequently of affording them to be sold at a much lower price, and this has ever since continued to be the case. But, upon the other hand, the evil which followed, was the total disappointment of those proprietors who planted upon this cheap system, as few of them, after several years planting and re-planting, had, in the end, a *tithe* of the trees so planted on their land. Disappointed in this manner, many established private nurseries of their own, and by degrees were able to supply their own demand; and where these were conducted on good principles, the result was highly satisfactory to themselves and an example which others followed. Such may be considered as the origin of private nurseries.

While the high price of trees continued, many landed proprietors were deterred from planting so extensively as they intended, in consequence of exorbitant charges; and when the low prices became prevalent, and a certain class of nurserymen became cheap contractors, not only for the supply of the plants,

but also for the planting, and, in many cases, for the enclosing and draining of the land, another evil followed, and of far worse consequences, namely, that the ground, in many cases, was not half planted; bad trees were used, and sorts unfit for the various soils operated on, were injudiciously planted where they should not have been; and, to crown the whole, sorts were planted which were in the greatest abundance, either in the estimation or stock of the contractor, without any regard to the interest of the proprietor, who, after a number of years of anxious expectation of having fine healthy plantations stocked with the trees of greatest value, found that he had his soil cumbered with Scotch fir, and probably larch, without a single oak or ash on an acre.

Before proceeding further, we beg most distinctly to be understood, that these remarks are not levelled indiscriminately at nurserymen in general, but to those who, by selling at a lower price than can cover the expense of rearing the trees in a proper manner, are without principle induced to adopt measures to ensure a sufficient profit for themselves, at the proprietors' expense and disappointment. Against these men, landed proprietors cannot be too sufficiently guarded. From our own knowledge, there are few professions in life wherein a greater number of respectable, honest, and honorable men are to be found, than in that of nurserymen; but in this, as in all others, there are some of the above description, always ready to contract to plant and supply at prices which no discrete man can afford to do, without entailing upon himself a serious loss either of capital or credit. These are our views of the foundation of private nurseries in general, although some few proprietors, for the gratification of peculiar fancies, have and still continue to rear their own trees; still by far the greater number have been induced to do so to prevent disappointment and imposition.

Proprietors who intend to plant should either rear their own trees under the direction of their gardener or forester, or else purchase them at once from a respectable commercial nurseryman, and have the planting executed by labourers on their own estates, and under the direction of a person competent to the charge. There is no part of forest-tree planting that should be

let by the task or piece, excepting it be the cleaning, draining, trenching of the ground, and the digging the pits for the trees. The very best trees should be chosen, and as good trees cannot be reared but at a very considerable expense, a liberal price should be given. Many, however, thinking to act with great economy, purchase their trees from itinerant nurserymen, and from such as offer plants at an unreasonably low price; such persons, therefore, may to a certainty expect to be disappointed. It should also be considered, that in regard to trees, as is the case in all other marketable commodities, there are high and low prices fixed, according to the value of the goods. When a liberal price is offered, good trees can always be procured; and we are confident that every respectable nurseryman feels more satisfaction at sending out good plants to his customers than bad ones; and we are also confident that good trees from the nursery, although high in price, are always much cheaper in the end than bad ones, which are got for nothing.

Local situation has also some effect in inducing our recommendations of private nurseries, for when trees are brought a great distance, the expense must be considerable, and the injury that they sustain no less so, from being a length of time out of the ground. In many sequestered situations, particularly in the north of Scotland, in Ireland, and Wales, where planting may be in progress, many unforeseen obstacles may delay the arrival of trees at their destination, several weeks after they have been taken up in the nursery; and, in these cases, a considerable number of trees are generally ordered at the same time, many of which often remain unplanted for three months; laid (as it is technically called) in by the heels, and not unfrequently in bundles of from five hundred to a thousand trees each, closely tied together. There are few places where it is difficult to procure plenty of men to assist in planting, but we have always found it better to continue the season of planting to a greater length of time, than to employ too many hands, many of whom never planted a tree before in their life. For these, and other reasons of an equally important nature, we would recommend the forming private nurseries near to where the scene of planting is to take place, as, by that means, the trees may be taken up accordingly as they are wanted; and it is reasonable to expect that

such trees will be much more likely to succeed, than if they were carried five hundred miles, and kept five or six weeks out of the ground.

It has been advanced by many practical men, and, as Sang observes, "Many are of that opinion still, that trees, in order to their being rendered sufficiently hardy, should be reared on the soil, and in the situation where they are ultimately to be planted; or at least in a soil and situation as nearly similar as possible." We know that this plan has been extensively practised by those who are engaged in the extensive plantations carried on in the Forest of Dean, and other places, with the best effect; but, as the intelligent author above-mentioned, further observes, "If the soil and situation in which the trees are ultimately to be planted, be favorable, we can see no solid reason for objecting to such a plan, particularly if the design be extensive, and such as may require many years for its completion; because a conveniently situated nursery is, in that case, highly desirable, not only as saving the carriage of plants, and facilitating the business of transplanting, but as increasing the chance of success, on account of the plants remaining a much shorter time out of the ground than if brought from a distance. But if the situation ultimately designed for the trees be cold, high, and bleak, and the soil of course various, some good, and much of it bad, or of an indifferent quality, *there* it would, by no means, be advisable to attempt the establishment of a nursery, and especially a nursery to raise plants from seeds."

In the formation of a complete nursery, it is almost indispensable that the soil be of various qualities; and when this is not naturally the case, it must, to a certain extent, be made so by artificial means. But as natural soils are to be preferred, some care ought to be taken in the selection; and, as it is somewhat different in this case from that of a kitchen or fruit-garden, where it would be extremely inconvenient to have it in detached pieces, we cannot see any objection to have several small nurseries instead of one large one, if the natural character of the soils be sufficiently various to admit of this arrangement. Thus a moist piece of ground might be enclosed for peculiar species, a piece of bog or peat soil for others, and one of land of a light loamy texture for a third. Strong, rich alluvial soils, we con-

sider would, in many cases, be too good for rearing forest-trees in, although extremely well calculated for that of fruit-trees and many kinds of shrubs. A poor barren heath, with sufficiency of peat earth on the surface, on which heath, *Erica vulgaris*, &c. grows luxuriantly, or a soil of decayed vegetable remains, denominated peat, although rather moist, would be a suitable nursery for the majority of American trees and shrubs; light friable, or light sandy loam, would be well calculated for forest-trees in general.

In regard to the depth of soil, we may say from one to two feet, are sufficient for the generality of plants, but none, if it can be avoided, should be less than one foot; and, as the first step towards its formation, draining, if it be necessary, and enclosing in all cases, should be first and strictly attended to. Young trees will not succeed, with a few exceptions, in wet ground, nor can seeds ever be expected to vegetate in it, although the very plants that spring from them may, at a future period, prosper to the extent of our wishes in very moist situations. Water, if possible, should be retained in tanks or small ponds, if it exist in the ground, but if not, it should be brought in pipes, or by other means, as, at the season of planting, and sometimes during dry summers, it is almost indispensable. In regard to enclosing, it is of the first consequence, not only sufficient to guard against the inroads of cattle, &c., but against the no less destructive quadrupeds, the hare and rabbit, which it is difficult to exclude, and which are very destructive to almost every species of tree in their young state. In countries where stone is abundant, walls of five or six feet will be more durable and impenetrable; and where such materials are not naturally to be had, pales of oak, or other durable timber, should be substituted; in the latter case, the ends of the pales should be let in a foot at least under the surface, for the better exclusion of rabbits. Where nurseries are intended for the exclusive purpose of rearing forest-trees, any artificial shelter is probably unnecessary, and is, when too much indulged, injurious; but such as are for the purpose of cultivating more delicate plants, shrubs, or fruit-trees, some attention ought to be paid either to select a sheltered spot, or to provide shelter by planting, &c.

A nursery in a private establishment may, with much propriety, answer the two-fold purpose of a nursery and auxiliary kitchen-garden; and, by a judicious arrangement of rotation of crops, would be beneficial to both. The ground which has been under forest-trees two, three, or more years, is, with the addition of a little manure, in excellent condition for the majority of culinary vegetables; and the cultivation of them in their turn, renders the soil in good condition for seed-beds, or for transplanting seedling-trees. We should observe, however, that potatoes should not precede a crop of seedling-trees, as it is with great difficulty that all of them are got out of the ground when the crop is removing, and those which are left will shoot up in the spring, and their removal will seriously injure the seedling-trees. Peas that have not been staked, but allowed to lie on the ground, are a good preparatory crop for seedlings, as they tend to clear the ground of weeds, by smothering them during summer. Carrots, onions, and similar crops, particularly the former, are excellent preparatory crops; the necessary hoeing or weeding also cleans the ground.

By a rotation of this sort, nursery ground will seldom require trenching after its formation, as a constant change of crops, with slight manurings, will be always sufficient. In regard to the rotation of crops, Sang has the following excellent remarks, which, although differing from our own opinion and practice in the exclusion of carrots as a preparatory crop, we give it with pleasure, and with all due deference, knowing, as we do in this instance, that we differ in opinion from one who has had such extensive practice in this branch of rural economy, and from whose writings we have derived much information. "There is one kind of crop," he observes, "which we judge peculiarly scourging for a nursery, and that is carrots; they are indeed rather severe for most lands, but we have seldom found a good crop of trees following one of carrots, while we have found peas, beans, and especially lettuces, easy and enriching crops, well adapted as preparers for succeeding crops of nursery articles. In so far as regards public nurseries, we had long remarked that those which partake as much of the character of market gardens as nurseries, generally produce the best seedlings, and young articles for sale, provided that the ground be

any thing more than of a middling quality. This fact, if one were wanting, is a sufficient proof of the utility of occupying the ground as above advised, in the double character of a kitchen-garden and nursery."

The foregoing remarks are applicable only to such nurseries as are within the park, or contiguous to some part of the domain, and in which sufficiency of young stock may be reared for the most extensive plantations. A few hints may be here useful in regard to nurseries at a greater distance from home, and intended for containing the trees, from the time of their being put out in nursery lines to their final transplantation. The situation of such nurseries is generally on or near the spot intended to be planted, and are not to be considered as of so permanent a nature as the home-nursery already noticed. A somewhat sheltered spot should also be chosen for this kind of nursery, and the soil, though poor, should be easily worked, in order to facilitate the operations of hoeing and cleaning. It is also of much consequence that such a spot be enclosed, sufficient at least to keep out cattle, if not hares and rabbits also. Here the young trees brought from the home-nursery, when fit to transplant into nursery lines, or to bed out, should be cultivated, till of sufficient size to plant out permanently. The preparation necessary for such a piece of ground consists in draining and trenching, or deep ploughing, which latter operation should be performed at least three times during the summer previously to planting, and be repeatedly harrowed, to break the surface sufficiently fine to receive the young seedling plants. Shelter may be obtained to such a nursery, first, by the selection of a spot naturally sheltered by rising grounds and fully exposed to the sun; or, secondly, by planting quick-growing hedges, both as a boundary fence, and also for subdividing the enclosed space into convenient departments. The sorts of trees best calculated for these fences, are poplar of any sort, spruce, fir, elder, or privet. Larch has often been used for this purpose, but is justly condemned by Sang and other nurserymen, as being liable to be overrun with the *Coccus larixæ*, an insect peculiar to this tree, and which not only destroys those which might be used for shelter, but would, to a certainty, infect the young plants of that tree in the nursery lines. Spruce

being evergreen, is, of all others, the best calculated for this purpose, as affording shelter in winter and spring, when it is the most required.

Unless the ground be very poor indeed, we would say that manure was unnecessary for such a nursery as that in view; but if it be considered rather poor, lime, chalk, or marl, would be beneficial; and, indeed, we think either preferable to animal manures of any kind, in almost all cases, for nurseries.

In the subdivision of nursery grounds, it is essentially necessary that walks be introduced, not only for the purpose of dividing it into regular quarters or pieces, but also for the convenience afforded by them, of enabling the owner or operatives to get to the different parts without difficulty, and without injury to the crops. A broad walk, sufficient for a cart, should surround the whole extent, and also intersect it at convenient distances, to facilitate the bringing in of manure, and the taking out the trees, &c.

PRELIMINARY OBSERVATIONS.

In offering the following remarks on the rearing and planting of trees, it may be necessary to observe, that the subject being so interesting, and embracing such a variety of objects, it cannot be so amply detailed in the following pages as could be wished, in consequence of the necessity of our being confined to certain limits; we will, therefore, endeavour to restrict ourselves to those parts of their culture which are most conducive to success, and chiefly treat on those parts most likely to be of use to the practical man.

In the arrangement of the matter, we shall consider each individual genus under separate heads, and adopt the alphabetical order of their names, as being the most perspicuous, and presenting greater facility of reference. It shall also be our endeavour to point out the soils suitable for each; their mode of originating, whether by seeds, layers, cuttings, &c.; their nursery culture, and their final transplantation; offering occasionally any thing new, curious, or interesting in their physiology, size, &c.

ACACIA.—(See *Locust-tree*.)ALDER.—(*Alnus*.)

The common Alder (*Alnus glutinosa*) is a native of Britain, and abounds naturally in wet boggy soils, and by the sides of rivers and lakes. It is, however, found to grow upon soils that are high and even dry, but not with that degree of luxuriance that it attains in soils of a moist nature. It seldom succeeds in chalky or calcareous soils; indeed, in such it can scarcely be said to live. It is well calculated to plant by the sides of rapid running streams, or large rivers, as from the multiplicity of its roots, which also extend a great way, it is of much use in binding the banks together, and preventing them from being carried away by the stream.

Alder is a tree easily propagated, succeeding well by cuttings of a large size planted in spring, where it is intended they are to remain, or, in common with almost all trees, from seeds, which vegetate freely if sown in a rather moist soil. The seeds ripen in October, and should then be gathered, making choice of a dry day for the purpose, which should be invariably attended to in all cases of seed-gathering, as entailing less trouble in drying them, and guarding against damaged seeds. The seeds are extracted by laying the cones upon a floor in a dry loft, and by frequently turning them, the seeds will fall out; or the cones may be thrashed, and the seeds separated by sifting. When cleaned, they should be kept in sacks till the spring, when they may be sown in March or the beginning of April. In preparing the ground for alder-seed, care should be taken to render it smooth and even, as the seeds are small and liable to be buried too deep; the beds should be four feet wide, and of the length of the quarter or piece of ground, or less if required. In regard to the quantity of seed to a given space of ground, it would be difficult to determine, as, like some other forest-tree seeds similar to it, it is difficult to ascertain the real quality of alder-seed; however, it is always better to sow thick in such doubtful cases, in order to ensure a crop. Alder-seeds are by some sown in autumn, as soon as

gathered, but this is not advisable, as they are very liable to be injured by the vernal frosts; and, independently of this risk, nothing in point of strength is gained by the plants. As the soil for sowing alder-seeds should be rather damp, the young plants are often liable to be thrown out by frosts during the winter, care, therefore, should be taken when this is likely to occur, to deepen the alleys or footpaths between the beds, in order to allow the superfluous water a free channel for passing off; and as a further means of preventing this evil, tanners' bark very much decayed, or rotten saw-dust may be sprinkled over the surface, but if this can be avoided, so much the better, for neither adds to the fertility of the soil, and unless very much decomposed, is evidently injurious to it.

Alders, when one year old, that is, the plants which were originated from seeds in spring, should be gone over the following spring, and all the strongest plants taken carefully up, so as neither to injure themselves nor the remaining crop of weaker seedlings, which are left in the seed-bed to gain strength for another season. Previously to the plants being taken up, the ground should be got ready, into which they are to be transplanted out to nurse. In choosing ground for this purpose, a loose and rather a moist sandy or boggy soil should be preferred. But a strong clay, or dry burning gravelly or sandy soil should be invariably rejected, as being alike uncongenial to their welfare. When the ground is prepared, they should be set out at twelve inches between the lines, and four or five between the plants. For plants of two years' growth, that is, those which were left in the seed-bed one year longer than the above, more room should be allowed them, and they should not be planted closer than fifteen inches between the lines, and six inches from plant to plant in the lines. This latter distance should also be allowed to those one-year old seedlings which are intended to remain two years in the nursery-lines. The routine of after-culture consists in keeping the ground perfectly clear of weeds, as nothing impoverishes the ground so much as allowing them to grow unmolested, and not only their robbing the plants of their due share of nourishment, but in cases where this is not strictly attended to, the plants are literally smothered with them. Of this we had last

year a very striking instance in regard to a very considerable piece of ground occupied by the plant in question, when we took the charge of a very extensive nursery of forest-trees, where the weeds were allowed to gain such a head that the scythe had to be employed to keep the coarse grasses and weeds as low as the tops of the trees; the consequence of which was, that out of fifty or sixty thousand alders that had been planted, not more than as many hundreds could be gathered out of the whole, and, independently of the loss of the trees, the ground had to be trenched and otherwise managed, as if it had never been in a state of cultivation. Hoeing, if taken in time, is a very simple process in horticulture, and if soon done, and well done, is easily done; but, notwithstanding this is acknowledged by every cultivator, it is strange to see how little it appears to be practised.

Alders, after standing from two to three years in nursery-lines, are very fit for final transplanting; but, if left longer than three years, they should be taken up and replanted in lines, at double the distance. This tree, like many others, will succeed well if planted young; and, in such cases, will make good progress if kept clear of weeds. But it possesses this advantage over many others, that it will transplant with safety when of a large size. The banks of rivers, and low swampy soils, where only it should be planted, are very liable to be covered with luxuriant vegetation; therefore, before planting young trees of this sort, the ground should be properly cleared and kept so till the trees become established, and above the reach of danger. Where this is not convenient, and we know there are many instances of that kind, larger trees should be used; and if carefully planted, will succeed as well as those planted younger, and where much expense has been incurred in trenching and manuring the soil.

This tree, under the most favorable circumstances, attains only a middle size; it is deciduous, and sometimes assumes rather a picturesque outline; is of rapid growth, when properly situated, and affording a considerable bulk of fuel, if managed in the copse manner, that is, cut over at stated periods. The timber is not reckoned valuable, but is used by turners, &c., and by carpenters, for roofing and flooring tem-

porary buildings. It has considerable claims to merit for durability in wet situations, and is therefore much used for supporting the roofs of coal and iron-mines, and also for embankments by the sides of ponds and rivers. The bark contains a considerable degree of astringency, and is used in the process of tanning leather, and by the native highlanders, in dyeing their *tartan* and other woollen stuffs. Charcoal is made of the wood, which is considered excellent in the manufacture of gunpowder. According to Evelyn, the oldest boats we read of, Noah's Ark excepted, were made of this wood; and this appears confirmed, by the following line of Virgil:—

“And down the rapid Po light alders glide.”

Vitruvius asserts, that the morasses round Ravenna, in Italy, were piled with this wood, to support the foundations of their buildings.

Of this genus, there are eleven species enumerated in the Hortus Britannicus, nine of which are natives of Europe, and two of North America. There are none of them but can be readily propagated by cuttings, and the most of them by seeds; nor are they cultivated with us with any view to utility, no farther than being considered ornaments to the park, lawn, or shrubbery.

ASH.—(*Fraxinus*.)

The common ash, *Fraxinus excelsior*, is a native of Britain, and is always found in the greatest perfection on dry loamy soils; and although its growth is, in such situations, less rapid than when in moist damp soils, it attains in them a greater age, and ultimately a larger size, and the wood is much more valuable. In wet soils, although, while young, it appears to be healthy and vigorous, still it will decay before it attains a useful size. In over rich soils the wood is seldom good, being short and brittle, but in sandy soils it is tough, and therefore of much more value. Strong clays are, of all others, the least calculated for its growth.

A prejudice appears to exist, by which the ash is almost excluded from forming a part of park scenery, some objecting to it

on account of its lateness in coming into leaf in the spring; others because it sheds them too soon, and others deny it any elegance of outline, with many more objections to which it appears to be unfortunately liable; be this, however, as it may, it is evident that this prejudice has existed for ages, for in general there are few trees of this kind to be met with in parks, where the other timber-trees appear to luxuriate.

The ash is propagated by seeds, which are annually produced in vast quantities, and vegetate freely. The seeds are ripe in October, and should then be collected and carried to a convenient part of the nursery, and laid in a flat heap, mixed with light sandy earth; care, however, must be taken that they be not laid too thick, for if this be not attended to, there is danger to be apprehended from fermentation, to which they are liable when laid in too great a quantity together. To prevent too rapid a state of fermentation, they should be frequently turned while in this state; and when all danger of fermentation is over, they may be covered up till wanted for sowing. Some sow these seeds the spring subsequent to the gathering, others not until the autumn, and others not until the second spring following. Seeds of many trees may be kept in the rot-pit, as it is called, one or two, or even more years, without their vegetating, provided that they be excluded from the action of air and warmth.

Any part of the nursery, if not too wet, is suitable for sowing the seeds of this tree, as it is hardy and not liable to lose its vegetating principle. Before the operation of sowing is intended, the ground should be regularly dug and levelled, and if in a very poor state a little manure may be applied. When the ground is dug, the whole should be divided into beds of four feet in breadth, and on them the seeds should be sown, and regularly covered to the depth of half an inch, or rather more. Some nurserymen sow in broad drills, as is often practised for spinach in the kitchen-garden, and, by this means, the seedling plants have a greater share of air than when in broad beds, particularly when they come up thick, and are not thinned out sufficiently soon. During their stay in the seed-beds, they should be regularly weeded, which is all that is required till they be fit for transplanting out into nursery lines, which will

be the case the spring after sowing. As we observed in regard to alders of the same age, the strongest of these also should be selected first, and transplanted, which will not only improve themselves, but also be of much service to the smaller ones remaining in the seed-bed. In regard to the distance at which they should be planted, one foot or fourteen inches will be sufficient between the lines, and from four to six inches from plant to plant. Hoeing and cleaning the ground must be attended to between the lines, and the seed-beds must also be kept perfectly free of weeds. When ash-trees attain the height of from eighteen inches to three or four feet, they are fit for final planting out, where they are to remain, and, like the alder, may be planted of a large size with success. In ground prepared for planting by ploughing or trenching, small plants may be advantageously used, but when this precaution has not been attended to, and the ground is rough and foul, the larger plants should only be used. No doubt can exist that land trenched, and otherwise prepared, will be more congenial to the first progress of any tree; but it is seldom possible, we may say, to trench and manure land upon an extensive scale for the mere purpose of planting; and it is to be questioned if the superior growth of the plantation would pay more than the interest of the outlay. As for manuring land intended for extensive plantation, we confess we can see no real utility in it, were it possible even to procure manure in sufficient quantity. A superabundance, or even a sufficiency of manure, is only to be obtained round great and populous cities; and, unfortunately, for those who recommend this practice, there is little ground in such neighbourhoods likely to be planted with forest-trees while capable of producing corn and hay. Upon small plantations, in rich and highly cultivated countries, this practice may probably be attended with advantages which can never be brought to bear on poor and mountainous tracts of land, where all the manure capable of being made is found scarcely sufficient for turnips, potatoes, wheat, and barley, crops of more immediate value; and when the surface strata are such that it is often no easy matter to find soil enough between the fragments of rocks wherein to plant the trees, yet, in such situations, plantations have arisen within the last sixty years of thousands of

acres in extent, and stocked with every species of tree generally cultivated with a view to profit or utility in this country. The extensive and thriving plantations of the Duke of Athol, the Earl of Braedalbane, and other proprietors, who have planted on the most rugged and barren hills, bear sufficient evidence of the truth of this assertion. Those who have extolled the superiority of expensive planting, are, for the most part, planters in miniature, who, in planting half-a-dozen acres, have lavished away a few pounds; and who, like a certain great horticulturist of the present day, have treated with contempt the more rational and substantial methods which have been sanctioned by experience, and crowned with success, and which they have vainly tried to turn into ridicule. Planting must always be considered as an appropriation of a certain capital laid out by the owner of land, with a view to ultimate profit and repayment. With this view, such land only should be planted that is incapable of producing a more certain and greater produce. As it is no inconsiderable sum that is required to plant extensively, we ought to study the most economical mode of proceeding; and no one who attempts to plant to a great extent will ever, we think, attempt trenching and manuring his ground.

As to final situation, the ash deserves a good soil, and not to be planted in quagmires, or on bleak barren sides of hills, as we have frequently observed, for in such situations the timber never can, nor will be good. It is said to impoverish the soil very much, and therefore to be unfit for hedge-row timber; it were to be wished that the same fault could be discovered in every other timber-tree planted in similar situations, for then we might entertain some hope of being relieved from seeing, mile after mile for a long journey, those poor mutilated, distorted looking things called hedge-row timber-trees, by which many parts of the kingdom are so very conspicuously disfigured.

The valuable uses to which the ash is applied are so numerous as to be with difficulty enumerated. "It may be noted, however," says a writer on this subject, "that the ash possesses a very singular property, namely, that of being in perfection even in infancy, no other tree becoming so soon useful. A pole three inches in diameter, is as valuable and durable for any

purpose to which it can be applied to, as the timber of the largest tree. The plough and cart-wright, the coach-maker and cooper, are the chief consumers of ash-timber; though, in many parts of the country, it is likewise used for various utensils, and for some articles of furniture. The ash affords a greater quantity of pot-ash than any other sort of timber in this country."

Of this genus there are thirty-six species enumerated in the Hortus Britannicus, of which twenty-five are natives of North America, two natives of Britain, four not known, and the remainder of the Levant, Corsica, Aleppo, and Tauria. Of the American species, only four were introduced prior to the beginning of this century, and, consequently, the merits of the others, as timber-trees, have not yet been ascertained with us. The accounts, however, we have of them, are sufficiently flattering to lead us to hope that 'ere another century begins, we may have several species of them added to our British timber-trees. The *F. excelsior* is the only one extensively cultivated for the value of its timber, but several of the others are sufficiently hardy, and of merits to demand the attention of planters. Most of the species perfect seeds, although not in this country, and are readily multiplied by that means. The varieties of *F. excelsior*, and those species which it is difficult to procure seeds of, increase readily by grafting on the common ash.

BEECH.—(*Fagus*.)

The beech (*Fagus sylvatica*) is also a native of our country, and is found naturally in sandy loams, and in calcareous soils, and abounds in many parts of Buckinghamshire and Hampshire, of a large size, in a natural state. It is found to prosper in almost all soils, but attains its greatest bulk, like the oak, in alluvial soils, in valleys near the sides of rivers. It will also become a valuable timber-tree amongst rocks and stones, where there is little mould to be seen; and it thrives in strong retentive clayey soils, even although the sub-soil be spongy and wet; but the most valuable timber-trees are found where it has been planted pretty thick, and drawn up to a tall straight trunk. It is one of the greatest ornaments to the park, the lawn, or the

avenue, and, in the two former cases, assumes a very graceful habit and beautiful outline. The beech is propagated by seeds, which are called *mast*, and ripen in October. It should be gathered as soon as ripe, as it soon after falls, and is eaten by squirrels, mice, pheasants, and other animals. The seeds are contained in a *capsule*, which opens when ripe; these are to be gathered as they fall or are shaken from the trees, and carried to a dry loft, when they will soon open, and the seeds can then be readily separated by sifting, which leaves it in a fit state, if dry, to be stored in till the spring. Nurserymen generally spread out the seed upon the floors of dry lofts, in preference to keeping them in sacks, as they are apt to become musty when kept in the latter way. Traps should be continually set during winter to protect it from mice and rats, both of which not only eat it on the spot, but carry it to their retreats.

In March, or the beginning of April, beech-seeds should be sown in beds, as already directed for alder and ash. The ground should be previously prepared by digging, and laid out in beds to the extent required: the seeds should not be sown too thick, as the leaves are pretty large, and the seeds, if well saved, will vegetate readily. When the sowing is finished, traps should be set for mice, and every precaution taken to keep off pheasants where they abound, for if they once get at them, it will be no easy matter to keep them off again. Weeding should be attended to during the summer, and by the following spring, many of the most forward plants will be fit to plant out into nursery lines. A precaution is very necessary to be used in taking up seedling beech, for, like the walnut, chestnut, and some others, they have long tap-roots, which are liable to be broken off in attempting to pull them up by the hand. A spade therefore should be used to loosen them at their roots, but this must be done in a prudent manner, and only applied along the edges of the beds, which will be found sufficient. When the strongest of the plants are thus taken up, the remainder should be regulated, if at all disturbed in the process, so as to prevent the admission of drought to their roots. The distance at which the seedling beech, thus taken up, should be planted, may be the same as recommended for ash, and the same attention paid them

during summer, as to cleaning, hoeing, and weeding. The following spring the remainder should be taken from the seed-beds, and in like manner planted out. Indeed, it is a rule from which only extraordinary circumstances can warrant a departure, that all seedlings, when two years old, should be taken up; if this be not attended to, the roots become naked, and the fibres few in number. The beds at this time on which the seeds were sown may be all destroyed, for it is only in the case of thorns, hollies, and a few similar sorts, whose seeds sometimes continue to come up for two, three, or more years, after sowing, that any more plants can be expected after the second year. In taking up all plants from the seed-beds more attention is required than is usually paid to them. The spade should be judiciously used for the purpose of loosening the soil, and the plants pulled up gently with all their fibres and roots uninjured, for although the trees of which we are now treating are hardy and indigenious, they are nevertheless tender and easily injured in their young state. As they are taken up from the seed-bed, they should be immediately laid in by the heels, unless the operation of transplantation goes on sufficiently fast to use them as they are taken up. They should certainly not be allowed to be on the surface in heaps, with their roots exposed to the frosty winds, which often prevail at this season, nor to the scorching rays of the noon-tide sun, which is equally injurious to them. The operation of transplanting would be more successfully done in damp showery days, provided the ground was not too wet, but this, when there is much to be done in this way, cannot be expected to be always the case; as a simple and excellent succedaneum, we would recommend puddling the roots previously to planting, which will not take up much time, and will evidently tend to enable the plants to sustain their removal with much less chance of injury. We may here observe, that when trees are to be kept in the nursery longer than three or four years after their first transplanting, that they should be, if not every year, at least every second year, taken up and re-planted, allowing them greater room every time they are removed, in order that they may have room to extend themselves, and also a proper breadth of surface to stand on, to afford sufficient nutriment for their roots.

When beeches are from eighteen inches to three feet high, they are in good condition for final planting. But trees of larger growth are apt to become naked at their roots, and devoid of fibres, and, consequently, unfit for planting, at least with success. As to final situation, the beech will thrive in almost all soils, but in those that are light, loamy, light sandy, or calcareous, it is found to succeed best; where grounds of that description abound, the beech may be profitably planted.

Its various uses are many, although in less repute now than formerly, when it was much used in various branches of machinery; but it is now, in these cases, supplanted by metal of different kinds. It is, however, used for some parts of ship-building and machinery, and is in considerable demand with the cabinet-maker, tool-cutter, and turner. The small-wood and branches make excellent fagots, and are used for smoking herrings and making charcoal. The leaves make tolerable mattresses, a circumstance noticed by Evelyn, as being prevalent in his day, and reminds us of the line of Juvenal--

“The wood’s a house, the leaves a bed.”

Beech-hedges were formerly very prevalent, but are now less general in and about gardens. They are of rapid growth, and can be planted of a large size, which is often desirable when a hedge is speedily required. Of this genus there are four species enumerated in the Hortus Britannicus, two of which are natives of North-America, and one only of Britain; the native country of the fourth, *F. comptoniæfolia*, which has by many been considered as only a variety of the common beech, is not correctly known. The American species are said to be valuable as timber-trees, but have not yet attained a proper size, nor are they in sufficient number in this country to form a correct idea how far they might be advantageously planted with a view to profit. The fourth species is seldom seen out of the arboratum or shrubbery; its merits, as a timber-tree, cannot be therefore calculated upon. Seeds are obtained of the American species from that country, by which they are increased, and the varieties, and the *F. comptoniæfolia*, are increased by grafting or inarching on the common sort.

BIRCH.—(*Betula.*)

The *Betula alba*, the only species of this genus cultivated with us as a timber-tree, is a native of Britain, as well as some varieties which have originated from it. It is found growing naturally in almost every kind of soil, and at a considerable altitude above the sea, as well as in the alluvial soils by the sides of the lowland rivers. The most durable timber of this tree is obtained from trees growing on the sides of hills amongst rocks, where, although its growth is much less rapid than in more congenial situations, its timber becomes much more valuable, not only on account of its durability, but also for its singular beauty, and, in such cases, it is made into beautiful pieces of furniture.

The fragrance of its foliage, and the elegance of its habit, claim a place for it in all ornamental plantations, and when planted out on the lawn, or in the park, its natural beauties are pleasingly developed. Upon the steep sides of hills, and in deep ravines, few trees are more beautiful than the white birch. The variety with drooping leaves (*B. pendula*) has long been held in high estimation, and, although anxiously propagated in England, is never likely to be so abundant as in the northern parts of Scotland, where, in many districts, it abounds more plentiful than the original with upright branches.

It is propagated from seeds, which ripen in September, and should be then gathered and dried as directed for alder, which it very much resembles. In spring it should be sown in well-prepared beds, finely dug and raked, in a soil rather humid. Care must be taken not to cover the seeds too deep, as they are liable to be injured, and often rot in the ground; and therefore we find some nurserymen sow them on the surface of finely-pulverized earth without any covering whatever. Birch-seed is not unfrequently successfully sown in autumn, that is, as soon as it is gathered from the tree, but unless in very favorable situations the young plants are liable to accidents during the winter. It is not easy to say how thick the seeds should be sown, as it is difficult to ascertain their quality;

however, they should be sown thick to ensure a crop, and if the plants come up too closely, they must be thinned before they begin to injure one another. During the first winter after sowing, young birch-plants are liable to be thrown out of the ground, and in time of frosts care must be taken to prevent this as much as possible, for which purpose nurserymen cover the beds with a thin sprinkling of rotten tan, which has undergone a long period of decomposition, and some, with less propriety cover them with fresh saw-dust. As the ground is generally moist in which birch-seeds are sown, we would suggest that the alleys, or foot-paths, between the beds be cleared sufficiently to allow of all superabundant moisture passing freely off, as the drier the beds are kept during winter, the less liable will the plants be to be thrown out by frost.

The strongest plants will, in the spring following the sowing, be in a fit condition to prick out into nursery-beds, or into lines; in the former case they should stand at from three to four inches apart, if very small; but if larger, should be allowed nearly double that room; and if put out into lines, they should be from twelve to fifteen inches distant, and from four to eight inches in the line, according to their size and strength.

Their future routine of culture consists in keeping the ground perfectly clear of weeds, and if not planted out permanently from these beds or lines, they should, the season after their first planting, be taken up and planted in lines at a greater distance from each other. Birch is seldom planted with a view to attain large timber-trees, its natural size being that of a tree of the third or fourth class of magnitude, although solitary instances occur of its attaining a very considerable size.

As a copse-tree, the birch becomes valuable, and bears cutting at stated periods profitably. It also obtains a place in all ornamental plantations, in consequence of the fragrance of its foliage and singular beauty of its outline; and few trees are more pleasing when grouped or planted singly in the park or lawn. By the sides of ponds, lakes, or rivers, the birch flourishes and gives a richness to the scene by the diversification of its growth, as well as its distinct character of head,

from that of almost all other trees. The sides of hills, and chasms between rocks, are also peculiarly improved by the varied and undulating character of this tree, and when planted *en masse*, or scattered promiscuously through the grove, it becomes equally interesting.

In England, the timber of the birch is less regarded than in Scotland, where the highlanders make use of it for almost every purpose where useful, durable, or beautiful timber is required. But only there is it to be found in perfection. As a fuel-timber, the birch has this peculiarity of burning clear, and emitting a pleasing perfume, without producing near so much smoke as most other timber, and is therefore much used in the smoking of herrings, and in the preparation of malt for the most esteemed whisky. Houses are built of it with the bark left on, which last for many years; and furniture is made of it, little inferior to that inlaid with satin-wood. The wheel-wright, mill-wright, and turner, use it extensively, and of late years its value was much enhanced, for the purpose of making barrels for the herring-fisheries.

The bark contains a considerable degree of astringency, and is probably next in value to that of the oak. The juice extracted in spring, affords when it has undergone the vineous fermentation, a pleasant liquor, known as birch-wine. Professor Pallas states, that the highly-prized Russian leather owes its agreeable smell to an oil extracted from this tree. "The oil," he says, "is prepared from the white bark, either taken from the live tree, or collected from those that are putrid in the woods. It is best made from the latter: because, by the putrefaction, it is freed from the inner bark; and the external white bark remains uncorrupted for ages, as appears by the old burial-places of Janisea, and the vaults of the very ancient city of Moscow, which he observed covered with birch-bark. The bark is gathered into a heap, and pressed into pits made in the shape of a funnel, prepared in clay-soil, and when set on fire it is covered with turf. The oil, distilling through the clay-hole at the bottom of the funnel, drops into a vessel placed to receive it, and it is then tunned into casks made of the hollowed trunks of trees. The pure limpid oil swims at top, and is in the greatest request for anointing

leather, on account of its antiseptic quality. The residuum is thick and sooty, and is employed for various common uses.

Of this genus there are seventeen species enumerated in the Hortus Britannicus, ten of which are natives of North-America, two of Britain, and the remainder of various parts of Europe. Some of the American species have merits as timber-trees, but those of Europe, excepting the *B. alba*, and its varieties, are merely cultivated for ornament. All or most of them are originated from seeds, which they ripen in their native habitats. The varieties of either may be successfully increased by grafting and inarching on the common sort.

CHERRY OR GEAN.—(*Prunus*.)

The common cherry, *Prunus cerassus*, is considered as indigenous to this country, and is found in so many situations, and under such a variety of circumstances, as seems to justify the conclusion. The wild cherry, or gean of the Scotch, is a different species, and described under the name of *Prunus avium*, or pubescent-leaved cherry. Both attain a considerable size; but the latter is by far the most valuable timber-tree. The wild-cherry, or gean, considered as a fruit-bearing tree, has considerable merits, and many varieties of it are to be met with in the gardens of the Scotch, who are fond of the fruit. Considered as a timber or ornamental tree, it has also considerable merits, and adds much to the beauty of our woods, groves, and parks, in spring, with its profusion of snow-white flowers, and in autumn by the varied and rich hues its decaying foliage gives the landscape; a circumstance often noticed and availed of by the artist. The soil and situation most congenial to the wild-cherry, are that of a sandy loam, on low ground or sloping banks. In wet cold soils it seldom succeeds; and if planted in rich soils, although it attains there a considerable bulk, becomes much less valuable, the timber being soft, light coloured, and of no durability; whereas, in sandy loamy soils, it becomes hard and beautifully variegated in the wood, and of great durability.

The wild cherry is propagated from seeds, which are ripe in July, and may be either sown immediately, or preserved in sand till spring; it requires to be planted out in nursery lines

from the seed-bed, where it may remain till planted out; or if wanted of a larger size, should be transplanted when two years old, at sufficient distance to allow the trees to attain a proper size for final transplanting. Stocks whereon to bud or ingraft the different varieties of the cultivated cherry, are obtained by sowing the seeds or stones of the different varieties of the wild and cultivated cherries; and when such is the case, the two years old seedlings should be attended to in the nursery lines, and properly pruned and trained to model them into stocks, either for producing dwarfs or standards, as may be required.

The wild cherry attains a size sufficient to produce timber in planks of from one foot to two feet in breadth; and if grown in a light sandy loam, will be durable, and of a beautiful colour. It has attained the name of Scotch mahogany, which it very much resembles when polished and stained. It is in considerable request amongst cabinet-makers, and by them manufactured into chairs, tables, and such like articles of furniture.

CHESTNUT.—(*Castanea.*)

The sweet or Spanish chestnut, as it is generally called, probably to distinguish it from the horse-chestnut is by some, considered to be a native of this country; and if so, it must have been much less cultivated than it now is, or else much less abundantly diffused, for there are very few instances of its being found of a great age, unless in situations where it must evidently have been planted. It is more probable that it has been introduced into this country; and some date its introduction to the time of Tiberius Cæsar, who is said to have brought it from Sardis into Italy, and from thence it might find its way into Britain, either by the Romans or the clergy.

The Romans gave this tree the name of *Castanea*, after a city of that name in Thessalia, from whence they first procured it, and where it is grown in great abundance by the Grecians; and what may be considered a singular circumstance, it still retains the same appellation in all the European languages.

Amongst those who affirm the chestnut to be indigenous to this country, may be noticed Dr. Ducarel, who states, in his

Anglo-Norman antiquities, that it is a native tree, and brings in as a proof, the existence of the wood in some of the oldest houses in London; but it is probable that what he has taken for chestnut, was only oak of a similar grain. He, however, appeals to a deed of gift, which is still in existence, from Henry the Second to Flexly Abbey, of the tithes of all his chestnuts in the forest of Dean.

The historian Camden informs us that Cowdery Park, in Sussex, abounded with fine trees of this kind; and Cheshunt, a village in Hertfordshire, is supposed to derive its name from the chestnut trees, which once abounded in its vicinity.

We certainly agree with Philips in believing that it was introduced by the Romans, who, having been masters of this country for nearly four hundred years, and being so much attached to horticultural pursuits, we may naturally conclude, would not fail to transport hither their hardiest kinds of fruits, and particularly those which were used as a substitute for bread.

The oldest specimens, probably, of this tree, which we have any account of in this country, is that of the great chestnut of Tortworth, in Gloucestershire, which has been noticed by the earliest historians of our country, and is supposed to have been 1100 years old. This tree is one of the most magnificent of our timber-trees, and equalling the oak both in height and bulk. Its longevity is great, as is sufficiently proved by the celebrated specimen on Mount Etna, which has attained the astonishing circumference of 204 feet. Some instances occur both in England and Scotland of its attaining the size of from thirty to forty-five feet in circumference; and, upon a moderate calculation, it would require a period of more than 500 years to attain that size. The chestnut not only thrives in any soil in which the oak is grown in perfection, but also attains a considerable size in soils of a poorer nature, and will make excellent copse-wood in almost any soil. Wet strong soils are, of all others, the best suited for this tree, when the object in view is to attain fine timber-trees. As an ornamental tree, few excel it, either in the beauty of its foliage, flowers, or the magnificence of its habit. "It is therefore very proper," Sang observes, "for the decoration of the park and of the lawn. Many chestnut-trees, however, should not be planted close to

a residence, because," as he observes, " the flowers emit a very disagreeable odour, which is offensive to most people."

It is observed by Philips, that it is the tree which graces the landscapes of Salvator Rosa, who painted on the mountains of Calabria, where it flourishes. Its ramifications are more straggling than even those of the oak, while its foliage, which is more loose and brilliant in colour, is less subject to the attacks of insects; and its yellow and umber tints greatly relieve the sable hue of the fir and the pine, and act like a blossom to enliven the month of November.

This tree is propagated from seeds, which ripen in England in October in fine seasons, but seldom, if ever, in Scotland. Nurserymen are supplied with home-saved seeds in good seasons, but, in unfavourable ones, from Spain, where this fruit is yearly ripened and imported into this country from thence as an article of luxury, and appears at our desserts from October till April. Chestnuts imported are by far the best either for the purpose of sowing or eating. They should be sown as soon as gathered or imported, in seed-beds or in drills, and covered to the depth of two or three inches. Mice and rats are very fond of this seed, and if once they find them in the ground, it is no easy matter to keep them off; attention should therefore be paid to guard them against such enemies. When the young plants appear in spring, and during the time they remain in the seed-beds, they should be kept clear of weeds; and the spring subsequent to the sowing they should be taken up, sized and transplanted into nursery lines twelve or fifteen inches distant, and five or six inches apart in the line. The season following they will require to be taken up and transplanted at greater distances, to afford them space to attain a proper size for final planting out. Chestnuts may be planted out when three years old, if the ground has been at all prepared for them; or they may remain in the nursery till they be five or six years old, and then may be planted out with success.

The timber of the chestnut-tree very much resembles that of the oak, and, according to Sang, approaches it in value next to the ash and Scotch elm. But what has been long mistaken for this wood in the roof of Westminster-Abbey, and that of the Parliament-House at Edinburgh, and other old buildings

in both of those cities, as instanced by Sang, seems very doubtful, and particularly so if this be not a native tree, which we see little probability of being able to confirm. It is much more rational to suppose, with Daines Barrington, and Professor Martyn, that what has been mistaken for chestnut, is in reality nothing but oak of a different grain; and the old pipes which are supposed to have been laid to convey the first water to the metropolis, and stated to have been of this wood, were, in all probability, nothing else but oak. The timber of this tree is, however, truly valuable, and will stand in situations exposed to wet and dry, when divested of its sap-wood, longer than oak; and for gate-posts ranks in durability next after the *Acacia*, yew, and probably also longer than the larch.

The following is adduced in support of its durability when exposed to wet and dry, and is extracted from the Transactions of the Society of Arts for 1789.—“In or about the year 1763, some gate-posts of oak, and others of chestnut, were to be repaired; they had the appearance of being put in at the same time, but the latter were much more sound, inasmuch that some of them were adjudged good enough to remain as gate-posts, and are now to be seen there (1788). Such as were too small were taken up, and set as posts to fix rails to. At the same time some new posts of oak were put in, there not being enough of the old chestnut posts. Though these were old when put in, twenty-five years ago, they are now (1788) more sound than the oak posts, which were then new. One side of the chestnut posts was the outside of the tree, but the timber is as sound there as in any other part, which would not have been the case with oak, the sap of which, next the bark, soon decays. The chestnut gate-posts had been put down many years before 1745; they have, therefore, probably stood the weather above half a century.”

Philips, in his History of Fruits, informs us, that the chestnut wood has recently been successfully applied to the purposes of dying and tanning, thus forming a substitute for logwood and oak bark. Leather tanned by it is declared, by the gentleman who made the experiment, to be superior to that tanned with oak bark; and in dying, its affinity for wool is said, on the same authority, to be greater than that of either

galls or sumach, and, consequently, the colour given is more permanent.

The wine casks in Italy and Spain are almost all made of this wood, and are preferred to any other, as being less liable to shrink or to communicate a disagreeable flavour to the contents. The bark has a considerable degree of astringency, and contains the tanning principle in about the same proportion with the larch and mountain-ash.

Of this genus there are three species, the common or sweet chestnut, the *C. Americana*, and *Pumila*, natives of North America. They are all propagated by seeds, which are occasionally imported, and the varieties are increased by grafting or inarching upon the common sort.

HORSE-CHESTNUT.—(*Æsculus*.)

The common horse-chestnut, *Æsculus hippocastanum*, is a native of Asia, and was introduced into this country in 1629. As an ornamental park-tree, few trees excel it, either in the splendour of its bloom or beauty of its foliage. It requires a loamy soil and sheltered situation, but is seldom injured by our severest frosts. As a timber-tree it has no pretensions, for although it attains a large size of trunk, the quality of the wood is such as to render it of little estimation in the eye of the profitable planter.

Gilpin observes, it is far from being a picturesque tree, its outline being that of a parabola; but all beauty is not picturesque beauty, and the foliage and leaves will ever advocate the cause of this tree, which, as Daines Barrington observes, may be compared to a giant's nosegay. It was formerly much used as an avenue-tree, both on the continent and also with us, as abundant examples are still in existence to prove.

It is propagated from seeds, which ripen most seasons with us in October; they generally drop out of their seed-vessels when ripe, and are gathered from the ground. They should be sown as soon as gathered, either in seed-beds, covered to the depth of two and a half or three inches, or in drills, to the same depth. If it be not convenient to sow them as soon as gathered, they should be slowly dried on a dry floor, and

frequently turned over, to prevent them from turning mouldy, a circumstance which often happens when they are kept in sacks, or too closely confined. The same enemies attack them that attack the sweet or Spanish chestnut, both in the seed-house, and also after they are committed to the ground. What has been said on the after-culture of the sweet chestnut is applicable to this tree also, only as the timber is far less valuable, of course a much less number of plants should be originated. The horse-chestnut, like most other soft-wooded trees, may be safely removed when of a large size, and when planted with a view to give effect in park scenery, should not be less than from six to ten feet high when planted; by which means, and by carefully guarding them for a few years against the attacks of cattle, they will the sooner be able to stand unprotected than if planted when of a smaller size.

ELM.—(*Ulmus.*)

Of this genus there are six species, which are natives of this country, and all of them possessing considerable merits as timber-trees. Of these, the *Ulmus campestris*, English elm, and *Ulmus montana*, Scotch or Wych elm, are considered the most valuable. The former of these is a very ornamental tree, considered either as a hedge-row tree, or to stand singly in the park, and several beautiful specimens may be seen of it in many of our best planted English parks. It is an exceedingly useful tree all over England, and it is with regret that we see it so frequently, nay, almost universally mutilated into so disgusting and ugly a state in our hedge-rows. "Nothing certainly can be more tiresome," says a very intelligent author, and keen observer of the mismanagement of this tree, "in travelling through the flat countries than the continual succession of meagre elms, like poles; from which we are now and then relieved by Lombardy poplars! which are worse, if possible, though occasionally, no doubt, by a much finer plant than either, the elder."

The wood of the English elm is very far inferior to that of the Scotch elm, both in durability and value. It is stated by Sang, in confirmation of this assertion, that, "in the sales

of these timbers, the English elm, amongst good judges, seldom brings more than a half, or even a third of the price of the Scotch elm, although both be of equal size and age. Prejudice, no doubt, may have some share in this matter, but certainly the timber of the one is very inferior to that of the other. Indeed, if it be considered that the one species is exceedingly hardy, and universally raised from seeds, and that the other may be even termed delicate, at least in Scotland, there can be little hesitation in determining which deserves the preference as a forest tree. The English elm is too frequently raised from layers or suckers. These never make the best trees; and they always produce suckers from their roots, and disfigure the grounds in which they stand. When intended for ornamental trees for the park or the lawn, they ought to be budded or grafted on the Scotch elm; in this way trees of superior vigour and figure will be obtained, and will never produce a sucker." Of this elm there appears to be very many in Scotland, although there are few of the Scotch elms, comparatively speaking, to be met with in England.

The Scotch elm attains a considerable magnitude, one of which is described in the Selkirkshire Report, p. 287, as being thirty feet in circumference, at four feet from the ground. And another, which we have frequently measured, which stands on the lawn at the east end of Taymouth Castle, is still a growing tree, and is fifteen feet nine inches in girth, nearly six feet from the ground. The merits of this species, in respect to its effect as an ornamental tree, places it next to the oak, to which it nearly approaches in its appearance, when cultivated in the grove or profitable plantations; "if properly nursed and trained, it becomes a straight, tall, and large-stemmed tree. In hedgerows it also becomes most useful and durable timber; and in open woods it naturally assumes many fine casts and forms for the purpose of ship-building and the like. In short, the timber of this tree is so useful and valuable, that it is always prized next to the oak."

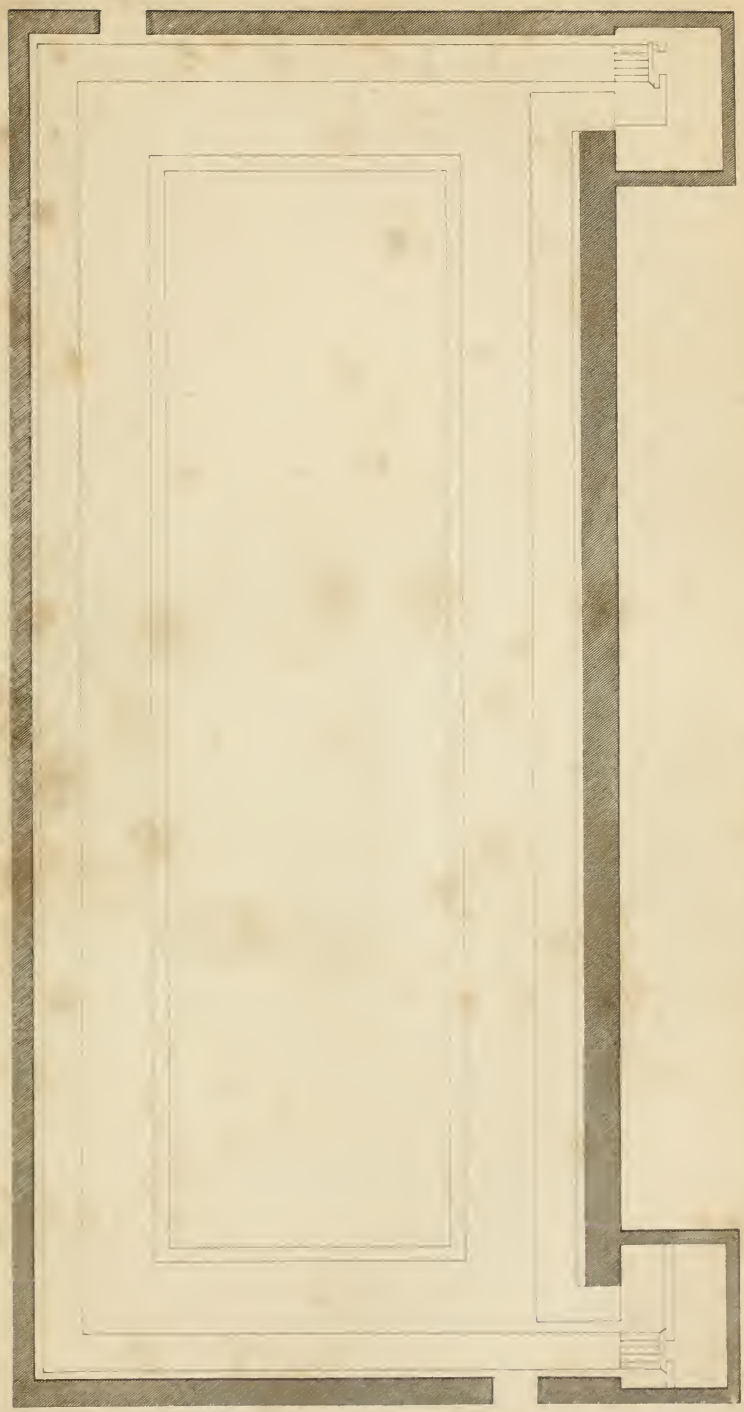
The soil in which this elm seems to prosper best is in a deep rich loam, although it will accommodate itself to almost all soils. In light sandy soils, upon a rocky bottom, this tree becomes most valuable in regard to its timber. Wet tilly clays



Drawn by J. C. Smith
1852

St. Paul's, 1777?

Ground Plan.



London, Published by Tho: Kelly, 17, Paternoster Row, Aug. 1st 1829.

E. Turvell, sc.



are of all soils the least congenial to it, but even in the crevices between rocks, where there is little soil of any kind, and on bleak exposed hills, this elm will attain a considerable size.

The different species of elm which perfect seeds, should be always originated from them: this is, however, not generally, by any means, the case; and hence follow, as a natural cause, the many distorted and worthless trees, which we daily see in plantations and forests, where more expeditious means have been used to produce plants of fit size for sale or planting. Our opinion is (although differing from men whom we esteem, and from whose writings we have derived much pleasure and advantage) that no tree should be propagated by other means than by seeds, unless extraordinary circumstances warrant a departure from that natural rule; and in collecting the seeds of all trees, greater care should be taken to select the seeds from the healthiest and most vigorous specimens, and not indiscriminately, nor by people unacquainted with the distinctions between a good and a worthless tree.

The seeds of the Scotch elms ripen abundantly about the middle of June, and should then be collected, and sown immediately after. Upon this subject Sang offers the following rational remarks:—"Elm-seed, when newly gathered, especially at this season, and kept together in a large quantity, has, on account of the juicy nature of its capsule, a great tendency to heat. It will, therefore, be proper to gather no more on one day than can be sown on the following morning; and it will even be right to spread the seeds thin during the night. The necessity of this precaution generally shows itself, for before they can be brought home in the evening of the day on which they are gathered, if there be a bushel or two in the sack, they will be found very hot. We have often observed them so much so, that if they had lain in that state till the morning, many of them would never have vegetated." Sometimes, however, elm-seeds are gathered with a view to keeping them for some time, as is the case when it is not convenient or possible to sow them till autumn or even spring; and it also happens when the intention is to send them to a distance. In these cases, some attention is requisite, both as to the gathering of the seed, and also to curing it, so that it may be kept

for some time with safety. When the seeds are observed to be perfectly ripened, they should be gathered immediately, as the procrastination of a single day often defeats the object in view, particularly in wet and windy seasons, as has been the case at the very time we were writing this article. High winds and rain have followed so closely, that we have been unable, with all diligence, to collect a single bushel of this seed. The following extract we are induced to give upon this subject from Nicol's Planters' Calendar, edited by Sang, a very respectable and excellent nurseryman; and we are the more induced to adopt this step as it is in unison with our own ideas upon the subject, although differing in principle from that of some of the writers of the present day:—"In gathering elm-seed, it should be chosen from the tallest, and most handsome, and healthy trees. Indeed, in every case, seeds should be collected from the most promising and healthy trees of their kind. Plants, like animals, in some measure, convey to their progeny their appearance and habits, whether good or bad. Therefore, although a tree have an abundance of apparently perfect seeds, if it be either visibly diseased, or be an ill-formed plant, not a seed should be collected from it. It is well known that disease and deformity in plants frequently do not prevent them from abundantly procreating their species. Indeed, in gardening, we always find that retrenching the roots of very healthful young plants is the surest method to throw them into fruit; though such retrenchment evidently makes the plant less healthy than it previously was."

As the English elm seldom, if ever, ripens seed in Britain, its best mode of propagation is by grafting on the Scotch elm, and not by layers, which is so generally the case. Grafting elms has been long a practice amongst nurserymen; and Langley relates a case of a nurseryman at Brentford-End, who purposed obtaining a patent from George the First for grafting and budding the English elm upon the Dutch elm, with a view to improve the growth of the former; and Virgil asserts, but which we much doubt the truth of, that a union will take place between the elm and the oak. Our ingenious countryman, Evelyn, speaks of the grafting of elms as being known and practised in his day.

Elm-seed may be sown as soon as collected from the trees, but we would rather advise saving it till March or April, or making three sowings: one in June, when the seed is gathered, one in March, and a third in April. The ground for the seed-beds should be rather rich, having been under a slight crop the preceding season; and if not manured for it, it should be done previously to sowing the elm-seed. As this seed does not require to be deeply covered, it is necessary to have the ground finely dug and raked before the beds are formed, which should be four feet in breadth, and the seed covered to the depth of half an inch. Sometimes the crop of summer-sown elms is destroyed in winter, when the season has been dry and the plants weak, and in such cases they are liable to be thrown out of the ground by the frost. Sometimes the spring crop is destroyed, if sown too early and severe frosts occur just as the tender plants are coming up, but by sowing at the three stated periods above recommended, we have three chances of obtaining a crop. It is advisable to sow elm-seed rather thin, as the seeds are in general good; and as it is better that the plants should remain two seasons in the seed-bed previously to their being planted out into nursery-lines, they will have a chance of attaining greater strength than if they were too much crowded in the seed-bed.

The after-management of elms, while in the nursery, differs not from that of other trees already noticed. They may be planted permanently out on trenched or prepared land, when four years old from seed; or, if in unprepared ground, they should be allowed one or two years longer. All the species of elm succeed, though planted of a large size; although, like most other trees, they prosper much better when planted before they attain too great an age.

Of this genus there are seventeen species enumerated in the Hortus Britannicus, six of which are indigenous to this country, five of North America, one of China, two of Siberia, one of Hungary, and two undetermined. The British species are the most valuable with us, although there are several of the North American ones which would, in all probability, be worth the notice of the planter; of the remainder, their merits, as timber-trees, are of no account. Such of this family, of

which it is difficult to procure seeds, may be readily increased by grafting or inarching: by either process a union speedily takes place. The Dutch elm, *U. Major*, of English botany, *U. Suberosa*, of Willdenow, although enumerated as a British species, is supposed to have been introduced here in the time of King William. The tree is of rapid growth, but the timber is not of much value. Dr. Walker even doubts if the common English elm, *U. Campestris*, be not also an introduced plant, and asserts that it was originally brought from the Holy Land.

HAWTHORN.—(*Mespilus Oxyacantha*.)

The hawthorn, although it is sometimes to be met with of a large size, cannot be altogether considered as a timber-tree, neither is it planted with a view to its attaining that size. It is, however, no less valuable, when considered as the best plant we have for the purpose of making living fences. It is widely diffused through the greater part of Europe, and with us in particular; it is found naturally in a variety of situations, and obtrudes itself upon our notice in the various characters of underwood in the forest or copse, as a detached tree in the park, and forming, as it were, natural fences by the sides of fields, &c.

“As underwood in the forest,” Sang observes, “where it grows spontaneously, it may rather be considered as out of place, and a nuisance. In the park, if growing at the foot of, or near a fine oak, it has an excellent effect. As a detached tree, if large and well formed, the hawthorn never fails to please. When clustered in handsome groupes on the lawn, hawthorn trees are very ornamental, particularly when in blossom. As a shrub, or a bush overhanging a rill, in a valley or dell, by the end of a mill, or the side of a cottage, the hawthorn appears to great advantage.”

The timber of the hawthorn, when it attains a proper size, is very valuable, and was much used by the millwright previously to the use of cast-iron, which has latterly been substituted for it. Sang observes, that the timber of this tree is often spoiled through inattention after cutting. If it be allowed to lie in the tree, it soon heats, and becomes brittle and worth-

less. It ought, therefore, he says, to be instantly cut up into plank, and laid to dry.

The principal use to which this plant is applied, is in the forming of fences, for which it is well adapted, and for this purpose is yearly propagated in vast quantities by the nurserymen. It is propagated from seeds which ripen in October, and may, in most seasons, be collected from old hedges in any quantity. As the seeds are collected, they should not be allowed to remain in sacks, nor too many of them put together, as they are extremely apt to ferment; and if such a circumstance occurs, many of them will be spoiled. As they are collected, they should be carried to the nursery, and spread out in a convenient spot (which, from the process the seeds undergo, is termed the rot-ground) not more than ten or twelve inches thick, and mixed with any light dry sandy soil. While in this situation, great care must be taken that they do not ferment too much, for fear of injuring their vegetative properties; if at any time fermentation becomes too great, they then should be turned over once or twice, which will sufficiently counteract that tendency, as well as hasten the decay of the pulpy matter with which the seeds are covered. In this situation they should remain for one year at least, although some nurserymen leave them for two. The intention of thus placing them in such a situation is, that hawthorn, ash, mountain-ash, and some other seeds, do not vegetate the first season after being gathered; and were they sown at that period, would be one year at least in the ground without vegetating. During that time they would be liable to be destroyed by vermin, the ground would be occupied to no real advantage, and an unnecessary expense would be incurred in weeding and cleaning the ground. As some of these seeds commence vegetating about eighteen months after they are gathered, it is judged the best practice to sow them into beds at that time, that is, the February or March following. In choosing ground wherein to sow hawthorn-seeds, it should be light; and if not moderately rich, should be made so by the application of good rotten manure.

It is likely that the beds now formed will require to remain so for three years, as it will not be before that period

that all the seeds will have vegetated, and the young plants attained a size fit for transplanting into nursery-beds or lines. In sowing this, and most other seeds, the ground should be deeply and finely dug; and as the beds for this seed are to be formed by having a portion of the surface pushed off with the back of a rake, or what is called cuffing, amongst nurserymen, it is necessary, for the better executing that process, that the ground be deeply and finely raked as the process of digging goes on. When the ground is thus prepared, the beds are marked off at the required breadth, which is generally from three to four feet, and the process of cuffing is then proceeded in, in the following manner:—

“After the ground is dug, and raked fine, as above, measure the purposed width, stretch the garden-line, and run it off along the side by the tread of your feet; return with one foot in the tread of the other, and so as to form an alley of three times the breadth of your foot. Having shaped the bed by these means, and being provided with a wooden-headed or cuffing-rake, stand on the alley on the opposite side of the bed; turn the rake on its back, and push off the earth from the one half of the bed to the purposed depth, as far as the side of the alley marked by your feet, being careful to keep the earth so pushed off quite straight. When one side is finished, turn round, and do the other in the same manner. Having completed the cuffing of the bed, carry the rotted haws in a close-wrought basket in one hand, and with the other lift them out; and with a sudden dash, cast them along the half of the bed next to you; turn round, and do the other side in the same manner. If your seeds be good, they should lie within one-fourth of an inch of each other. Having completed the operation of sowing, if the state of the seeds will allow, draw a roller of about sixty pounds weight, and exactly the breadth of the bed, along it, which will press in the seeds, so as they will maintain their place during the operation of drawing on the earth again, which is presently to be done. If, however, the seeds be too moist to allow the roller to pass over them without sticking to it, beat them in with the back of the spade. The operation of fixing them in the soil being performed by one or other of these means, take the rake,

stand on the alley on the opposite side of the bed, put in the teeth of the rake immediately beyond the cuffing or ridge of earth pushed off, and by a sudden pull draw it on the bed, so as to cover its lower half equally; and having finished this half, turn round, and finish the other in like manner, and the operation is completed."

Sometimes haws are sown in drills, which, upon the whole, is a much better way, as affording a freer circulation of air to pass through the plants; and as the largest and best plants are always to be found on the outsides of the beds, sowing in drills, instead of beds, presents a greater number of outsides, and consequently a greater number of strong plants. When this mode of sowing is to be adopted, it should be carried on as the ground is dug; thus having dug the breadth of eighteen inches or two feet, stretch the line parallel to the trench, and with a broad hoe or spade form a drill about nine or ten inches broad, into which sow the seeds, and cover with the mould taken either out of the drill already sown, or from the next following. While performing this operation, the operator should stand in the trench, which will not tread the dug ground; having sown one drill, proceed to dig another breadth, and so on until the whole be finished.

When the seeds of hawthorns have been one year sown, it will be necessary to draw the strongest plants from the seed-bed, to be transplanted out into nursery-beds or lines; in taking up these plants, the greatest care ought to be taken both to preserve the roots of the plants removed from injury, as well as the seeds which may not yet have vegetated, and the small plants left to gain strength for another season. To facilitate the pulling up of the young plants, the beds should be loosened with a fork in a careful manner; and when the plants are removed, the beds should be regulated so as to leave them that the drought may not penetrate to the tender roots of the plants which are left. Those taken up should, as soon as possible, be planted either into beds, at about four inches apart, plant from plant, or into lines twelve inches distant, and four inches apart, plant from plant, where they are to remain, if in beds as above, for one season only; but if in lines at the above distance, they may remain for two years,

by which time the most forward of the plants will be fit for planting out for hedges, and the less forward should be planted again in the nursery, to gain strength for another season or two.

When hedges are to be planted, and afterwards attended to in a proper manner, the younger the plants used the better. But it must be confessed that, in general, the management of hedges is very little attended to, even by those who ought to be most sensible of their utility; and we find it very frequently the case, that after a hedge has been planted, very little is thought of it afterwards. Cattle are allowed to browse on it, if the plants ever attain a size sufficiently large to rear their heads above the weeds, with which they are allowed to be smothered; and if they be fortunate enough to attain any height, they are often allowed to grow on until they become quite thin at the bottom, and after being five, six, or ten years planted, are probably cut down to the bottom, to be again, for a year or two, liable to all the disasters and accidents which they had weathered in their growth. Those who wish to have good and substantial hedges, must pay some attention to the plants during their first few years' growth. Keeping them clean, guarding them against the browsing of cattle, and a judicious application of the hedge-knife, is all that has to be attended to; and if judiciously done, and followed up, good and substantial fences may be expected. Upon this subject Sang offers the following excellent remarks:—"The rapid progress of the hedge depends, in a great measure, on the goodness of the plants employed. The goodness of these, however, does not so much consist in the thickness of their stems, as in the numerous fibres of their roots. A very thick-stemmed plant may have hardly a fibre at its root to support it when planted. The most desirable plants are, therefore, such as have the greatest number of fibres at their roots with a clear and vigorous stem. It must be observed that, if thorns stand in the nursery-line more than one, or, at the most, two years unremoved, their roots become thinner of fibres, which consequently render them less fit for the purpose of planting for hedges, than if they had been removed at an earlier period of their growth. One-year seedlings of good growth, nursed

for one year in rich earth, will generally make fitter plants for planting out than when they are allowed to stand for two or three years in the nursery-lines. Two-year seedlings, carefully lifted from the seed-bed, so as to preserve their roots entire, and when one year nursed in rich mellow earth, will also make excellent plants for hedges. Indeed, plants of these ages, so treated, will outgrow those of greater size in any soil or situation whatever. The obvious cause is, that small plants, even by the same treatment, are raised with better roots in proportion to their stems than larger plants. In the choosing of quicksets, respect should therefore be had to the roots more than to the tops of the plants.

“But there is a double advantage in using young plants as above recommended. If they are to be bought, they will cost less money than older ones. If they be reared in a private nursery, less time is required, as well as less labour to produce them. Further, they are better fitted for very exposed situations than such as are older: not because their tops are less bushy, which, since these are to be cut off, is immaterial, but because they have better roots and more fibres in proportion to the stems, and of course are better fitted to seek pasturage for their sustenance, and to take a firm hold of the soil.”

Previously to planting quicksets or thorns, it is necessary to shorten them considerably, and this is done by taking them up in small handfuls; and having laid them straight, the tops, to within about six inches of the part of the plants that were under ground, are cut off with a sharp hatchet on a block of wood. Some people shorten every plant individually with a knife; but if the other method be properly done, it will be found far more expeditious and equally complete. When the plants are so shortened, only the tips of the long tap roots, or such as are without young fibres, should be shortened, and that only to a very limited extent.

HOLLY.—(*Ilex Aquifolium*.)

The holly is a native of Britain, and found growing in woods and forests as underwood, and also on elevated and

bleak hills and deep valleys in many parts of the kingdom. It is an evergreen-tree, of great longevity, and valuable, either when considered as ornamental or useful. There are many varieties of this genus to be met with in those situations where they abound, and in a cultivated state above forty pretty distinct varieties are to be had, many of which are exceedingly interesting and curious. As a timber-tree, it becomes valuable when of a great age, and is in all stages of its growth, admitted into the park, the lawn, and the flower garden, with good effect. Hedges are made of it, which are impenetrable, and some beautiful specimens still exist, which must have been planted above two centuries. Hollies are propagated from seeds, which ripen abundantly every season, and the varieties are increased by budding and grafting them upon the common sorts. In October the berries are ripe, and should then be gathered, and, as observed in the case of hawthorn-seeds, they should not be allowed to remain in sacks nor heaps together, as they are apt to ferment violently, and in such cases many of them would be spoiled. As they are gathered, they should be carried to the rot-yard in the nursery, and treated as already observed in the case of haws. Holly-seeds generally require to remain for two years in the rot-yard, to secure their speedy vegetation when sown, but as some of them will vegetate the second year, it is considered good practice to sow them after one year's rotting; when sown, they will continue to come up for two seasons, and probably a few will not spring before the third. When the seeds of this tree are to be sent to a distance, provision ought to be made to prevent them from heating too much while closely packed up, a circumstance which very frequently happens, to the loss of the purchaser. Sang recommends packing them in deep narrow hampers, and to put not more than one bushel into each. Were it equally convenient to the parties, it would be a much safer way to dispose of those seeds only that have undergone the change in the rot-heap, instead of the fresh-gathered berries. In the latter case, there would be much less danger to be apprehended from fermentation, and no possible injury could happen to the seeds in the one way more than the other. In regard to sowing the seeds of holly, the same precautions should be used

in preparing the ground, in forming the beds, and covering the seeds, as recommended in the last article. When the plants have been two years in the seed-bed, they should be taken up, and transplanted into nursery-lines, or into beds, allowing the plants in the latter case to stand at from four to six inches apart, and in the former, one foot between the lines, and four inches plant from plant in the line. All evergreens are impatient of drought at the time of their removal, therefore, dull, cloudy, or wet weather should, if possible, be chosen for that purpose, and a rather damp or shaded spot is the most favorable for them to be planted in. In such beds, as above directed, they should be allowed to stand for two years to gain strength; at the end of which period they should again be taken up, and planted in lines at a greater distance, where they should also remain for two years; at the expiration of which time, many of them will be in a fit state to plant out permanently in the shrubbery or plantations. The smaller ones being selected, should again be planted in lines at least fifteen or eighteen inches distant, and from a foot to fifteen inches apart in the line, which will be sufficient room for them to attain a size fit for the final planting.

The holly, under all circumstances, is a slow-growing tree, and although it bears transplanting, while young, with safety, it nevertheless is very considerably checked in its growth by being removed, unless very great care be taken to remove it with a large ball. This is not always practicable, as the soil in which the holly delights, which is of a light and rather sandy nature, little of the surrounding mould can be taken up with the roots. Dull damp weather should therefore be chosen, and April, August, and September, may be considered the best seasons; although holly, as well as most evergreens, may be removed at any period of the year, for particular purposes, except only while they are making their young shoots. Puddling the roots should never be neglected; and when they are planted, a liberal supply of water should be given them, both at their roots and also over their heads, unless the weather should be sufficiently wet to render such labour unnecessary. Wet weather should therefore be chosen for planting all evergreens; and if only ordinary care be taken in removing the

plants, little doubt can be entertained of success. Hares and rabbits are very destructive to this plant; and as it is some years before it attains a size sufficient to protect itself against their attacks, some defence or other should be devised for their protection. The ground also where they are planted should be kept clear of weeds round them, which, if not attended to, will, in many cases, completely check them. Hollies succeed well under the shade of other trees, and to a certainty are more successfully planted in such situations than when fully exposed to the rays of the sun; and when planted in the park, or in exposed situations, a two-fold benefit may be obtained by surrounding them with a close-wattled fence, both for the purpose of defending them from the attacks of hares, rabbits, &c., and also to afford them a partial shade until they be completely established; after which, few trees are more hardy and capable of defending themselves against their enemies.

A curious physiological circumstance has been often noticed by botanists in regard to this tree, which is, that it is furnished with prickly leaves near the ground, and entirely smooth ones towards the top, when growing in situations which render it liable to the attacks of deer or other animals. The large hollies in Needwood Forest are described to be of this sort, and are armed with prickly leaves for about eight feet high, which would seem to imply a consciousness in the trees, that when their branches were out of the reach of the deer, they had no occasion for arms.

Holly-plants, for the purpose of making hedges, should be planted as such, when they have been nursed for two years from the transplanted beds, that is, when they are four years old. In planting them, they should stand at the distance of nine or ten inches apart; and if protected for the first five or six years, will, soon after that, under good management, defend themselves from all attacks, and make excellent fences, affording shelter, as well as a boundary either to fields or plantations.

The holly attains a large size both in height and girth of stem, and specimens are to be occasionally met with above six feet in circumference. The value of the timber of such trees

is very great, although few who are possessed of such trees will be induced to fell them, unless under peculiar circumstances.

The remains of considerable sized forests of holly are to be seen in some parts of Aberdeenshire, on the banks of the Dee, and also at Gordon Castle, in the adjoining county. An interesting account of these trees is given by Mr. Sabine, in the Horticultural Transactions, who was particularly struck with their venerable and magnificent appearance. The timber is as white as ivory; it is often used as a substitute for that article, in inlaying and veneering, and is in much request by the makers of mathematical instruments and turners. The well-known glutinous substance, bird-lime, is made from the bark of this tree when freed from the woody fibre

HORNBEAM.—(*Carpinus Betulus.*)

This tree is also a native of Britain, and is found naturally in a variety of soils and situations, and prospering in every one which is capable of being planted. It is, however, far less prevalent in our woods and plantations than almost any other of our indigenous timber-trees; and this circumstance has been accounted for in the following manner:—In the early years of horticultural improvements, hornbeam-hedges were much in fashion, and nurserymen then propagated them from layers, which was judicious enough for the purpose for which they were then intended; but from such layers, fine trees never could be expected, and hence the majority of those which were planted with a view to attain the size of timber-trees continued meagre, straggling, deformed bushes, and few of them ever attained any useful size. Miller reprobated this mode of propagation, and since his time, the hornbeam has been more generally originated from seeds, and now we find fine specimens of trees of that age; but as a forest-tree, it appears to be still too much neglected. The general character of this tree resembles that of the beech; the timber is also very similar, and is applied to every purpose for which the beech is used; indeed, for millwright's work, it is considered superior. As has been already observed, it is increased by seeds, which

ripen in September and October, in great abundance, in the English woods, but rarely, if ever, in Scotland. The seeds should be sown as soon as gathered, in beds of the ordinary sizes, and in almost any tolerably good nursery-ground. Many of the seeds will vegetate the first year after sowing, and all of them the second. When the young plants are sufficiently strong in the seed-bed, they should be carefully removed and transplanted into nursery-beds, or lines, as already directed for beeches, their whole nursery culture being similar to that of that tree. As to final situation, the hornbeam is not particular in its choice of soil, nor of situation. However, in common with every other tree, it will attain a greater bulk sooner in good soil and sheltered situations. It is not much planted as a forest-tree, but evidently deserves to be more attended to. As a copse-underwood, it is valuable, and affords excellent shelter for game, for, like the beech, the half-decayed leaves remain on the trees till spring. It also yields a considerable bulk of fagot-wood, and makes excellent fuel, dead-fences, and hurdles.

There are several varieties which are met with in cultivation, but they can only be considered as merely ornamental, and as such deserve a place in the arboratum or shrubbery.

The varieties are multiplied by grafting on the common sort, and the true exotic species *C. Americana* and *Orientalis*, are increased by the same means, or by seeds imported from their native habitats.

LOCUST-TREE.—(*Robinia Pseud-Acacia*.)

This family may chiefly be considered as ornamental, and as such deserve a place in every shrubbery of extent. The *R. Pseud-Acacia* attains a considerable size of trunk, but is more regarded in consequence of the great durability of its timber, which, if we can credit Mr. Cobbet, is almost incorruptible. This species has been long cultivated here, and some considerable sized specimens are occasionally to be met with on the lawn, and in the plantations of some of our best planted residences; but if not planted in very sheltered situa-

tions, it is apt to be broken, and the timber injured by the boisterous winds with which we are visited during spring and autumn in this country. Its flowers and foliage are peculiarly interesting and beautiful; but, as an ornamental tree in its general outline, it cannot be allowed much merit. Its leaves are late in spring before they appear, and they fall again early in autumn. It is of rapid growth while young, and better calculated for copse-wood than for forest planting. It is a native of North-America, where it is much prized on account of its durability; and for gate-posts, palings, and similar purposes, has considerable merits, and may be advantageously planted with us. It is not likely ever to become a timber-tree of the first class in this country; but in North-America it attains a large size, and the wood is esteemed by the cabinet-maker more than that of any other timber whatever. It prefers a deep sandy soil, and bears cutting freely, and in this way has been advantageously cultivated as a copse-tree, as appears from a communication to the Board of Agriculture.

It ripens its seed in September, by which it is readily increased, and which should be saved till spring, and sown in any moderately good nursery-ground, where it will soon come up, and will be, by the spring following, in a fit state for transplanting into nursery-lines, when, after one or two years growth, it may be planted out, where it is permanently to remain.

This tree succeeds best when planted young, for from the nature of its roots, which are long and thinly furnished with fibres, it seldom succeeds well, if planted when of a large size.

LABURNUM.—(*Cytissus Alpinus*.)

The tree, or Scotch Laburnum, is so called to distinguish it from the common laburnum, with which it is often confounded, but which are very distinct species, the latter only attaining the size and character of a straggling large shrub; whereas the former attains that of a considerable sized tree. They are both natives of Europe, and have long been cultivated in this country as plants of ornament; the former, how-

ever, is also valued for its timber, which is much prized by the cabinet-maker and turner for its hardness, beauty, and durability. It is the false ebony of the French, and is sometimes used as a substitute for that wood by the British artists. No tree which is cultivated in our plantations has greater claims on our attention as a tree of ornament, either planted on the skirts of plantations, or on the lawn, or in the park. When planted with a view to produce timber, it should be intermixed with other trees, and attention paid to training it up to one proper stem; it is not slow in growth, and will, in favorable situations, attain a large size in thirty years. Sang records an instance of this timber being sold at a public sale, in 1809, as high as half-a-guinea per foot; and gives another instance, in 1806, of its being sold for seven and sixpence,—a price which no other timber that is produced in this country would ever be expected to bring. The tree laburnum is propagated by seeds, which ripen yearly in great abundance. It is in perfection in October, and is easily distinguished from the common or shrubby sort, by the largeness of its leaves and flowers, as well as by its attaining the character of a tree, while the other attains only that of a shrub. It is difficult, notwithstanding, to obtain genuine seeds of the tree kind, as so little attention is unfortunately paid to the collecting of seeds in general. Whoever wishes to propagate both sorts separately, should be particular from what trees the seeds are obtained. When the seed-pods are gathered, they should be left to dry in an airy loft, and, when sufficiently dry, they should be stored by in sacks, still enclosed in the pods, where they ought to remain till the spring, when they may be taken out and sown. The end of February, March, and April, is the proper season to sow this seed, which should either be sown in drills or beds, as already noticed for haws, but they need not be so much covered. They will soon vegetate, and the spring following will require to be drawn from the seed-bed. The strongest plants may then be transplanted into lines, one foot apart, and the plants six inches apart one from another. The smaller ones may be placed in beds, about four or five inches apart.

LARCH.—(*Pinus Larix.*)

The larch is a native of Alpine situations in the South of Europe. The finest trees and most valuable timber being found in chasms on the north sides of mountains, where least exposed to the sun, and where the summer may be said to be of short duration. Many opinions have been offered as to the exact date of its introduction into Britain. It appears to have been cultivated by Parkinson in or previously to 1629; and in 1664, we find it noticed by Evelyn as having attained a considerable size at Chelmsford, in Essex. Harte, in 1715, recommends it in his essays, and has left us a drawing of the tree. It is rather singular that Langley, who wrote so soon afterwards, should not mention this tree. Its introduction into Scotland is stated by Mr. Lambert to have been effected by the celebrated Lord Kames, in 1734, and planted on the Blair Drummond estate; and, in 1741, it was extensively planted by the Duke of Athol, at Dunkeld, who, according to Dr. Walker, had introduced it from London, as a delicate exotic, in 1727, along with some orange-trees, and these are said to have been kept in the green-house at Dunkeld, until their hardy properties were discovered, and then that they were planted out in the garden, where they remain to this time, and one of them has attained the great size of one hundred feet in height, and ten feet in circumference. There are, however, specimens of this tree of much larger size, in the garden of General Campbell, at Monzie, in Perthshire, the largest of which is seventeen and a half feet in circumference, and another nearly as much. The larches planted throughout Scotland, about fifty and sixty years ago, are now trees of vast magnitude, and have fully answered all the eulogiums which have been bestowed on it, so much so, that the larch is now considered, on the whole, the most useful and valuable timber-tree, not even excepting the oak. Some of these trees, on the Dunkeld property, have attained the height of one hundred and twenty feet in the space of fifty years, that is, an average growth of above two feet four inches annually; and some of them, in eighty years, upon poor hilly land,

fifteen or sixteen hundred feet above the level of the sea, have attained the astonishing size, as to produce three hundred feet of measurable timber. As to soil, the larch will flourish in every soil, "on hill, on dale or mountain, in loam, in clay, in gravel; in peat-earth, in moor-earth, amongst rocks and stone: in short, every where, excepting in standing water." There are, however, soils, in which it attains a greater size and a better quality than in others. Rich soils, in general, are unfit for the larch, but none are too poor for it; although it will grow for the first few years luxuriantly, and even attain a large size in rich soils, nevertheless, in such it is apt to decay at the heart, and consequently be rendered useless in point of timber. It is not, therefore, the soils in which this tree appears to make the most rapid progress while young that are most congenial to it, but actually the reverse; and it also appears that a certain degree of altitude of situation is necessary to produce it in perfection. The larch is not only valuable in itself when fully grown, but is the best of all trees for nursing others in bleak and exposed situations. "Indeed," says Sang, "no tree is so eminently qualified for this office. In most situations, even in the most exposed places, and thin soils, it outgrows all other timber-trees for the first ten or twenty years after planting; and if planted in sufficient numbers, in proportion to the principal trees to be nursed, it affords them good shelter; while, by its towering, it tends to draw them up for timber. It will arrive at a timber size in almost any situation or soil, (as already noticed,) and of course it may with propriety be planted on a broad and extensive scale, and may be expected to make the most durable timber on the more elevated and exposed situations, where the soil is not of a very rich quality. Certainly, had the vast forest tracts, which have been planted with Scotch fir in many parts of the country, being planted with larches, at least in those soils and situations adapted for them, the estates would have been enhanced in value; the larch bearing the ascendancy over the Scotch fir in the following important circumstances:—that it brings double the price at least, per measurable foot; that it will arrive at a useful timber size in one half or a third part of the time in general which the fir requires: and, above

all, that the timber of the larch at thirty or forty years old, when placed in soil and climate adapted to the production of perfect timber, is in every respect superior in quality to that of the fir at a hundred years old. The general usefulness of the larch-timber is now pretty well known in most parts of this country; it is therefore hardly necessary to enumerate the purposes to which it is applicable. It may be sufficient, perhaps, to state, that it is useful in ship-building, house-building, in husbandry, and in cabinet-making." The larch is possessed of the properties of durability to an extraordinary extent, and is therefore well adapted for piles for the foundation of bridges, embankments by the sides of rivers, gate-posts, and indeed for every purpose where strength and durability are required.

The larch, like most of the resinous trees, is better when propagated from seeds than by other means. Indeed, with this division of plants, it is a difficult matter to increase them otherwise, although some of the rarer species of *Pinus* are occasionally increased by layers, and some few by grafting. The larch produces seeds abundantly with us, not only on old trees but upon young ones also. The cones are ripe in November, December, and January, and should be collected from the healthiest and best trees. There are often cones of two years' growth upon this tree; but, in gathering, care should be taken to select those of the last year's growth. As they are gathered, they ought to be dried, so as to prevent a disposition to turn mouldy, which would injure the seeds, if allowed to go too far. When sufficiently dry, they should be laid up in a dry loft till the spring, when they will require to be taken out of the cones previously to sowing. Some, however, take out the seed during winter, but it is much better to keep them in the cones till spring.

As the process is the same in regard to taking out the seeds from the cones of all the pine or fir tribe of trees, we will, for greater brevity, detail that process under a separate head, and where it is applicable to the others, we will occasionally refer to it.

EXTRACTING THE SEEDS FROM THE CONES OF THE PINUS FAMILY.

As the seeds of this valuable division of trees are matured within a hard scaly seed-vessel or cone, it is not without difficulty that they are extracted when they are required to be sown. Of all the *coniferous* trees, the larch, Scotch fir, cedar of Lebanon, and black American spruce, are the most difficult to part with their seeds, and hence many methods have been devised and adopted to facilitate that object.

The use of fire-heat in differently constructed kilns has been very generally used, particularly with the extensive nurserymen in the North, for the purpose of opening the cones. Splitting the cones, with an instrument for the purpose, has been used to a great extent; and grinding, either by the cone-mill or common improved bark-mill, has been still more generally adopted. When the quantity of seed required is small, the most convenient method of separating them is to split the cones into four equal pieces, by means of a small triangular iron or steel instrument sharpened to a point, and having three cutting angles, put into a wooden handle like a shoemaker's-awl. In performing the operation of splitting, the cone should be held between the fore-finger and thumb of the left hand, with the smaller end or point resting on a board. The point of the instrument is inserted in the centre of the broad or bottom end of the cone, and with a slight effort, the cone is divided into two portions; the same operation is performed with each half, which leaves the cone into four equal parts. The cones, thus divided, may then be placed on a sieve before a moderate fire, and the seeds will soon drop out on a piece of paper or cloth placed underneath on purpose to receive them. The splitting of the cones is often carried to a great extent by commercial nurserymen, and as the operation is performed in bad weather, or by old people or children, the expense is always covered by the larger quantity of uninjured seeds which is obtained by this method than by grinding them, which, although more expeditious, is destructive to a large portion of the seeds. Many of the pine tribe will open their cones before a moderate fire without being split, and when

there is the conveniency of hot-house flues being kept moderately warm, seeds may be obtained in large quantities. We have often extracted considerable quantities of coniferous seeds by the simple process of placing the cones in baskets, sieves, or shallow boxes, having a large sheet of coarse paper spread over their bottoms on which the cones are placed. These are then placed on the top of the flues in the pine-stoves, vineries, or in any other house of equal temperature. Once a-day they are examined, and the seeds which have dropped out on the paper are removed and sprinkled with a little water. They are then laid on a table in the seed-room, until a sufficiency be extracted to fill a bag or drawer, when they are reserved till sown. Seeds of the larch, stone-pine, pineaster, &c., are readily obtained by this process. When the quantity to be obtained is considerable, the cone-kiln, as described by Sang, and which is the most general in use, is much to be preferred, and is as follows:—"The cone-kiln is constructed after the manner of a common malt-kiln, the bearers should be about nine feet distant from the fire, and two inches apart. A hair-cloth is spread over them from side to side of the kiln, and the cones are laid on it to the thickness of twelve or fourteen inches. A gentle fire is then applied, and regularly kept up till the cones become opened. During the time of drying, the cones must be frequently turned upon the kiln, and when the seeds begin to drop out, they must be removed to a dry barn, and sifted till all the seeds which are loose fall out, and are taken from among the cones. The cones are afterwards to be thrashed severely with flails, and sifted as before, and so on, till the seeds are taken out as completely as possible."

This we look upon as by far the most safe method of separating the seeds from the cones, and requires only care in the application of the fire-heat; which, if it be too violent, would not only scorch and dry up the seeds and render them useless, but from the quantity of resinous matter contained in the cones might set fire to the whole fabric. As an improvement upon this plan, we would suggest, as has been recommended by Sang, the operation of splitting the cones previously to their being laid on the kiln, the extra expence of this operation will be more than repaid in the extra quantity of good seed.

The use of the cone-mill, as well as that of the bark-mill, is radically bad, as many of the seeds are bruised and rendered useless that have passed through them, and this also appears to have been the conclusion drawn by Sang, who had a very extensive knowledge in these matters in the Kirkaldy nurseries, which he so long and so scientifically managed and possessed. "Indeed," he says, "among all the methods which we have known adopted, to perform the painful and laborious work of extracting the seeds of the larch, the plan of splitting them singly is infinitely the best and safest for the seeds, and ought to be adopted by every one who has occasion to use only small quantities of seed."

To facilitate the process of splitting cones, particularly such as are large, like the cedar of Lebanon, cluster-pine, &c., steeping them in water for a day or two previously to splitting them, may be advantageously adopted.

The beginning of April is a very proper time to commence sowing larch-seeds, and from that period to the end of the first week in May, but after that it may be considered too late for the purpose. The ground for the larch seed-beds should be well prepared previously to this time, that is, it should be winter-fallowed, or dug two or three times during winter, but always in dry weather. Nurserymen, of great experience, recommend as the best preparatory crop for seedling-larches, that of two-year seedling Scotch firs, or if that cannot be had, land from which a crop of two-year seedling-larch has just been taken up. If the soil be moderately good of itself, a very slight dressing of rotten manure may be given, but this should be neither rank, nor in too great a quantity. The ground should be well broken in the process of digging, and rendered as fine as possible on the surface by repeated raking; and divided into beds, which is the best form for all the fir-tribe seeds to be sown in. If the seeds be good, and have been taken from the cones by the process of splitting them, they should be sown about a quarter of an inch apart, seed from seed; but, if they have been extracted by the mill, they should

be sown thicker, as a considerable number, to a certainty, will prove abortive, having been bruised in the operation.

When the seeds are sown, they should be covered to the depth of a quarter of an inch, and previously to their being covered, a light wooden roller should be drawn over them to press the seeds firmly into the bed, as well as to place them all at an equal depth. While in the seed-beds, larches should be carefully and frequently weeded, for, if once overgrown with weeds, they will seldom do much good, at least for one season to come, however well they may afterwards be kept. This rule is applicable to all seedling plants, and cannot be too often, nor yet too strongly recommended.

In one season after sowing, the young larches will, if all circumstances have been favourable, have attained a sufficient size for transplanting; but, as it is often desirable to have a number of two-year old seedlings, we would therefore propose selecting the strongest plants of the one-year old seedlings, which may be done with safety, if a little care be taken in the operation; and when they are taken up, they should be immediately again planted in nursery-lines, and are henceforth called transplanted trees, to distinguish them from those taken at once from the seed-bed, and planted out where they are to remain. If they are to be transplanted in the same nursery in which they have been reared from seed, no more ought to be drawn from the seed-bed on one day than it is intended to plant before night, as nothing is so injurious to young trees in general, as to pull them from the seed-beds and leave them in the sheds, probably tied up in bundles, for a week, or even a month, before they can be planted. This, however, we often see done, and by those who ought to know better, and is like many other methods which are erroneously called by them saving of labour, but which is decidedly the very reverse, and is always fraught with the most serious injury to the plants. Larches, when transplanted into nursery-lines, should be allowed at least twelve or fifteen inches between the lines, and from four to six in the line, and, during their stay in the nursery department, should be kept clear of weeds, &c. In regard to the size which the larch should be when fit to plant out, where it is to remain for timber, or for

nursing up other trees, a considerable latitude may be taken; but as a principle, which should never be overlooked, the younger they are planted out the more likely are they to succeed. Most of the deciduous coniferous trees are difficult to transplant when of a large size, whereas few trees succeed better when they are planted young, and of course of a diminutive size. Those, who have most successfully and extensively planted the larch, prefer trees not more than one year old, as seedlings, and which have been one year nursed in good ground, and those will be by that time about from six to nine inches in height, and if the soil has been good, will have an abundance of fibres; a circumstance of far more importance to their future welfare than if they were twice as large in branches. Indeed, we would say, that larches above eighteen inches in height are much too large for planting, let the ground be ever so well prepared for them, and such as have pertinaciously persisted in planting them of a larger size have been uniformly disappointed in the end.

LIME.—(*Tilia Europæa.*)

The lime is a native tree, and one of great beauty and interest, when considered merely in an ornamental point of view, and is suited either for the park, the lawn, or the avenue; indeed, for the latter purpose, it would appear that it has been chosen by common consent at least for two centuries. As a timber-tree it has few merits, being in general used by carvers, gilders, &c., as the wood is soft, and easily cut; it is also used for charcoal for making gunpowder, and the inner bark is made into bass mats, so useful in covering up garden productions, and packing of goods in general. The flowers are fragrant, and afford a great store of food for bees, and are, on the same account, often planted near the mansions of the great. Evelyn was exceedingly partial to this tree, and asserts, that the fragrance of its blossom is an admirable preventative against the epilepsy, or falling sickness.

Limes are in general increased by layers, as being the most expeditious way, but as they ripen their seeds so plentifully, we can see no real reason why such a slovenly method of in-

creasing them should be countenanced; as it is well known that trees, originated from layers, cannot ever be expected to be equal to those propagated from seeds. The lime ripens its seeds in October, and should be sown as soon as gathered, by which means the seeds will vegetate the following spring; whereas, if not sown till the spring, they would not vegetate till the following year, and consequently one season would be entirely lost. Their after management, while in the nursery, is not different from that of other trees under similar circumstances, and consequently need not be repeated.

The lime is one of those few trees that will grow freely, although planted of a large size; however, the best-sized trees from a nursery, to plant with a view to profit, are those from eighteen inches to three feet in height; nevertheless plants from that size to five or six feet, may be safely planted. As to soil, the lime is not particular; it will grow in almost all soils, but flourishes best in a deep loam where it is moderately sheltered. Indeed, the lime is not a tree that is calculated to stand in the most exposed situations, and it is seldom planted in such, at least not in this country

Limes propagated by layers may be operated upon in spring or in autumn, and at these seasons, March and October may be considered the best. In laying limes, the various processes of tonguing, sliting, ringing, &c., are dispensed with, as the plants are found to root so freely, when laid in the more simple method of merely bending a part of the shoot, so that it may be buried about three inches under the surface, having the leading end of the shoot shortened back to one eye, and that eye only a little above the surface of the ground: this bend is so performed, that the bark is not even cracked in the process. Those shoots laid in spring, will, for the most part, be fit to remove from the stool, and to be planted into nursery-lines the spring following that in which they have been laid, and so in most cases will it be with those which are laid in autumn. When the young plants are removed from the stools or mother-plant, they should be immediately planted out in nursery-lines about two feet apart, and a foot or fifteen inches apart, plant from plant, in the line. Here they may remain until planted out, where they are to remain. The stools

from which one crop of layers has been taken, will continue, under good management, for a number of years to produce yearly crops of plants; and as these plants in favorable soils are of sufficient size for sale the year after being removed from the stocks, at least they will be larger than plants of five years growth originated from seeds. Nurserymen find a great saving in adopting this mode of propagation, but the consequence falls on the planter, who is thus filling his ground with trees which will never be equal to those which have been originated from seeds. The consequence is of far less importance if such trees be planted for copse-wood, as when cut down to the root, the future tree may, under proper training, be much altered for the better.

MAPLE.—(*Acer. Campestre.*)

The common maple is acknowledged as indigenous to Britain, and is found in situations which can leave no doubt of the assertion. It is not a tree of value for its timber, but is ornamental, particularly when old, and probably less cultivated than any other of our indigenous plants. It is propagated in the same manner as the sycamore, to which it is botanically connected, but which is a far more valuable tree.

OAK.--(*Quercus Robar.*)

The oak has long and justly been regarded as the monarch of the wood, and it is one of the most generally useful and highly-prized trees that abound in our forests. The oak appears to be almost peculiar to Britain, no other country excelling us either in the beauty, magnitude, or quality of our oak timber, and this has been long ago noticed by our poets, our statesmen, and historians. Although Scotland abounds with oaks, yet there are not such specimens to be met with there as in England, some of which we have measured from thirty to forty feet in circumference. Indeed, the larch may be now called the national tree of Scotland, for which that country is likely to be as famous as England has long been for the number and magnitude of its oaks. The oak is not very choice in regard to soil, for it prospers, although not with the same degree of vigour, in almost all soils, and in almost all situ-

ations. "It thrives best," Sang observes, "however, in strong deep loams, incumbent on gravel or dry rock; but in all soils, in which there is any considerable proportion of loam, it will thrive in a greater or less degree. In low situations, where the soil is deep and moist, it grows rapidly, and attains to a great size; but in such places it is found to decay sooner than it does in a more elevated situation, with a drier soil. In light soils of little depth, although it grows slowly, it becomes firm in texture: and the timber, though smaller in size, acquires a state of maturity sooner than that grown on more cool and retentive soils. In deep cold sand it will root firmly, and arrive at a great size. In clay, incumbent on till, to which all other trees, excepting the beech and the sycamore, have an aversion, the oak will grow, and produce useful timber." In good soils, and in sheltered situations, the oak will make the most progress, and will keep pace with many other kinds of trees; whereas, on poor soils and in bleak exposed situations, its progress will be but slow. In planting young oak plantations, therefore, it is necessary to plant other trees of a hardier nature as nurses, to shelter and draw up the oaks, which, without this assistance, would never attain the character or habit of fine timber-trees. The best tree to use for nursing up oaks is evidently the larch, which is a rapidly-growing tree, as well as a profitable one, even while in its young state. The oak is propagated only by seeds when the end in view is to propagate extensively; but the scarce varieties and species of exotic oaks are and may be increased by grafting or inarching upon the common kind.

The seeds of the oak are known by the name of acorns, and ripen every season in more or less quantities in England, and are in proper condition for being gathered about the middle of October. Acorns were the food of the early race of mankind in almost every part of the temperate world, and in the days of Strabo the inhabitants of the mountainous parts of Spain ground them into meal. In times of scarcity they have been ground and made into bread, both in this country and in many parts of the continent of Europe. "The study of Botany, and the encouragement given to agricultural and horticultural pursuits," Philips sensibly observes, "have so wonderfully improved the state of this country, that what in

early ages a king would have feasted on, the beggar now refuses, and the acorn is scarcely known as affording nourishment to the human species, even among the wandering vagrants who pitch their tattered tents, and cook their scanty fare beneath the branches of the trees that produce them.

“ Acorns continued to be of so much importance, for many ages after they had been relinquished as the food of man, that a failure of them frequently caused a famine, as the swine, which our woods and forests maintained, formed a principal part of the food of our ancestors. The author of the Saxon Chronicle, after describing the extraordinary famine and mortality of the year 1116 records particularly the failure of masts in that year.

“ We find that, as early as the end of the seventh century, our Saxon ancestors had a law, and particular directions given them by King Ina, respecting the fattening of swine in woods, since his time called *pawnage* or *pannage*. Elfhelmus reserves the pannage of two hundred hogs for his lady in part of her dowry; and acorns are particularly mentioned about the middle of the eleventh century, in a donation of Edward the Confessor.

“ Before the Conquest, the Wealds of Sussex were one continued forest from Hampshire to Kent, principally of oak-trees, that were only valued by the number of swine which the acorns maintained; and so accurately was the survey taken in William the Conqueror's time, that woods are mentioned in Domesday Book, of one hog.” The Romans, in the time of Strabo, were supplied principally with hogs fatted in the woods of Gaul, and with us, to this day, acorns are used for the same purpose, as well as for the fattening of deer.

Acorns are often sown immediately after being gathered, and in that way succeed perfectly well; they are also often kept in sacks or on a dry floor till February, when they are also sown with nearly the same success. In gathering the seeds, choice should be made of the finest specimens of trees, which has been already noticed, as they are more likely to produce a healthy and vigorous progeny than those which are ill grown and stunted in their growth.

At whatever season the seeds are sown, whether in autumn or spring, a much less difference will attend the result than is allowed by some; if the seeds have been carefully selected,

and the ground properly prepared for them, plants from either sowing may be expected to prosper equally well. It is important that the ground be sufficiently prepared for the reception of the seeds, for if it be not done now, it cannot be done afterwards. For this purpose, it should be deeply and finely dug, and rendered fine and smooth by the use of the rake, and if the ground be not in a tolerably rich condition, we would recommend a moderate supply of well-rotted manure.

The acorns may either be sown in beds or drills, but the latter is by far the better way where the intention is to allow the seedlings to stand more than one season before transplanting, that is, in the seed-bed. They should be equally distributed either in the drill or on the bed, at about the distance of half an inch apart from each other, or rather more, and covered to the depth of two inches.

After sowing, a watchful eye must be kept on the beds or drills, to guard them from the attacks of mice or rats, either of which would be equally destructive to them before they begin to vegetate. Traps should be thickly set over the ground, and other means adopted to keep under such destructive enemies.

The general routine of nursery culture, as to transplanting into nursery-lines, beds, &c., is the same as has been detailed for other forest-trees already noticed; any reference, therefore, at present, to that part of their management, may be deemed superfluous.

A tree of so much national importance as the oak, deserves our greatest care in rearing and finally planting out. Many plant at random, and never think that different species of timber-trees require different soils to bring them to the greatest degree of perfection, but such is the case; and where adapting the trees to the soil and situation has been attended to, the result has been highly satisfactory; whereas, a total neglect to such arrangements has been attended with disappointments. Upon this subject Sang offers the following rational observations, which, we may add, are in accordance with our own:—"We are clearly of opinion," says he, "that the best method is to plant each sort in distinct masses or groups, provided the situation and quality of the soil be properly kept in view. There has hitherto been too much random work carried

on with respect to the mixture of different kinds. A longer practice, and more experience, will discover better methods in any science. That of planting is now widely extended, and improvements in all its branches are introduced. We, therefore, having a better knowledge of soils, perhaps, than our forefathers had, can with greater certainty assign to each tree its proper station. We can, perhaps, at sight decide that here the oak will grow to perfection, there the ash, and here again the beech; and the same in respect to other trees.

“If, however, there happen to be a piece of land, of such a quality that it may be said to be equally adapted for the oak, the walnut, or the Spanish chestnut, it will be proper to place such in it in a mixed way, as the principals; because each sort will extract its own proper nourishment, and will have an enlarged range of pasturage for its roots, and consequently may make better timber-trees.

“Although by indiscriminately mixing different kinds of hard-wood plants in a plantation, there is scarcely a doubt but that the ground will be fully cropped with one kind or other; yet it very often happens, in cases where the soil is evidently well adapted to the most valuable sorts, as the oak, perhaps that there is hardly one oak in the ground for a hundred that ought to have been planted. It not unfrequently happens, too, that even the oaks, or other hard-wood trees which are to be met with, are overtopped by less valuable kinds, or perhaps such as, all things considered, hardly deserve a place.

“Such evils may be prevented by planting with attention to the soil, and in distinct masses. In these masses are insured a full crop, by being properly nursed for a time with kinds more hardy, or which afford more shelter, than such hard-wood plants.

“There is no rule by which to fix the size or extent of any of these masses. Indeed the more various they be in size, the better will they please the eye of a person of taste when grown up. They may be extended from one acre to fifty, or a hundred acres, according to the circumstances of soil and situation: their shapes will accordingly be as various as their dimensions.” In regard to the size of oak trees at their time of planting, opinions are at variance, some advocating plants

of a considerable size, and others such as are quite small and young, while a third recommends sowing or planting the acorn, where the future tree is intended to grow. Large plants of any tree cannot be with propriety planted to any extent, when the object is profitable planting; and too small plants are also, in many cases, objectionable, particularly when the surface is rough, and the ground not prepared by ploughing or trenching.

Oaks, that have stood two years in the seed-bed, and which have been afterwards planted out into nursery-lines for one year more to strengthen, may be considered the best of all plants for successful planting, and at that age are better furnished with fibres than when of a greater size or age. Next to these, we would say that the oaks which have been transplanted from the seed-bed, when one year old, into nursery-lines, and left in them for two seasons to attain strength, are the best.

There are above forty species of oaks introduced into this country, all of which are timber-trees in their own countries, but are of too slow a growth, or of too delicate a nature, to attain a profitable size in this country. The two native species, the *Quercus robur* and *Q. pedunculata*, are by far the most valuable; and to them may be added, if planted in favorable situations, the Turkey oak, *Q. cerris*, which promises to become a most valuable addition to our forest timber-trees. Little attention has hitherto been paid by the collectors of acorns, to distinguish between the two British species above; but this, like the gathering of seeds in general, is committed to those who know or care little about the matter. This, however, deserves attention, as the merits of the *Q. pedunculata* are evidently much greater than those of the *Q. robur*, and is readily distinguished from the latter by the circumstance of the acorns being placed on long foot-stalks, whilst those of the *robur* are nearly *sessile*; and, independently of the superior utility and hardness of the timber, the pedunculated oak is, in fact, the most magnificent of the two British sorts.

PINE.—(*Pinus*.)

Of this very useful and interesting family there are about fifty species introduced. The greater part of which are, however, cultivated only in a botanical point of view. The spe-

cies cultivated for timber are the *P. Sylvestris*, or Scotch fir, *Pinus Larix*, already noticed, *Pinus Picea*, silver fir, and *Pinus Abies*, or Norway spruce fir. It is, however, very probable, that some of the other species may be worth cultivation, as they appear abundantly hardy, and the timber appears to be equally valuable, when of sufficient age and size. Of these, the Scotch fir (*Pinus Sylvestris*) is by far the most generally planted, if we except the larch, either with a view to attain a timber size itself, or to nurse up other trees of a more valuable nature.

SCOTCH FIR.

This is probably the most hardy tree indigenous to our country, and is found, although in a stunted state, throughout the North of Europe, almost within the limits of perpetual snow, and is also found within the tropics. It appears to be naturally an inhabitant of barren mountainous districts, and in such is found to flourish much better than in more fertile and sheltered valleys. In rocky, sandy, or the most barren kinds of soils, its timber becomes most valuable, both in durability and beauty, and trees, self-sown, are, for the most part, preferable to all others. The Scotch fir, like the larch, is only to be found in perfection in the highlands of Scotland; and in that country are still to be met with the remains of forests of a very ancient date. The proper soil and situation for this tree are, according to Sang, "on the sides of mountains, in dells and hollows, among stones and rocks, beside rapid rivulets or mountain torrents, it is found in high perfection; and if it stand single, it is of great beauty. In many parts of the Scotch highlands, where the soils are extremely various and much mixed, the Scotch fir has arrived at a good size, and often attained remarkable dimensions. In any kind of soil, from a sand to a clay, provided the substratum be rubble, or rock, it will grow and flourish: but, in wet, tilly soils, it ought never to be planted: because, wherever the roots have exhausted the turf or upper-soil, and begin to perforate the sub-soil, the tree languishes and dies." It will, however, grow, and indeed flourish, in almost every soil and situation, if not too rich, but not with the same degree of vigour; neither will

the timber, in such, be alike valuable. How it attained the name of Scotch fir, is difficult to say; for we do not find it to be a native particularly of that country, but also of most parts of Europe, Asia, Africa, and America, and is found in perfection in the torrid, temperate, and frigid zones.

“It may, indeed,” as Ponty observes, “be called the Planters’ Forlorn Hope, as, where it fails, the case is truly desperate. For instance, it is planted with success on the most barren commons, where no other tree nor plant (the heath excepted) will grow. On sites, which are elevated and exposed to particular currents of wind, it often proves the only tree that can be got up, except so far as others may rise under its shelter. In the sea-breezes, too, it is frequently observed, that while every plant around it bends to the blast, as if seeking protection, this holds its head erect, and bids defiance to the noxious gale.”

As a nurse, no other tree equals the Scotch fir, and, like the larch, it will become a large and valuable timber-tree, in soils and situations where no other tree would at all succeed. The disrepute into which this tree has fallen, of late years, is probably more to be attributed to the planter than to the tree. In soils, capable of bringing the oak, ash, chestnut, and similar trees, to perfection, it would be wrong to plant this fir, unless, as a nurse-tree, to be cut out while young, while it may, with every propriety, be planted with a view to produce timber-trees, in soils and situations decidedly unfit for either of these to prosper in. Choosing fit soils and situations for different trees to be planted in has been too little attended to, and the erroneous practice of planting trees promiscuously in the same plantation, whatever the soil may have been, has, we think, been attended with sufficient disappointments to convince the observing planter of the truth of this assertion. The most successful result will always be from such plantations where the kinds of trees have been suited to the soil and situation.

The Scotch fir is increased most readily by seeds, which ripen in cones, annually, in December and January, and should then be gathered and laid in a dry loft or barn till the seeds are to be extracted from them, as has been directed for larch.

The seeds of various species of the *Pinus* family will retain their vegetative properties for two or three years, if left within the cones, but soon lose that property after being extracted from them. Nurserymen, therefore, seldom take out the seeds until near the time of sowing, and, in a great measure, calculate upon securing a crop of firs by strictly attending to this point. In April, the seeds should be sown in beds of any convenient breadth, in ground which has been previously prepared by digging, &c.; and if the ground be poor, manure should be added; but if manured for a light previous crop, it will be better. Ground, upon which a crop of peas has been grown the preceding summer, or any other kitchen-garden vegetable, excepting carrots, will be very suitable for a crop of seedling firs. The ground should be well broken in the process of digging, and should be raked as that process proceeds. When the beds are laid off, the seeds should be regularly sown on them, so that the plants may come up about a quarter of an inch from each other. It is very necessary that care be taken in covering the seeds, that they be not buried too deep, nor yet left too near the surface; upon an average, half an inch may be considered the proper depth at which they should be covered. After the seeds are sown, a watch should be kept over them, as they will be liable to be destroyed by birds of various kinds; the usual methods of protecting seeds in gardens should be had recourse to, and persevered in, for if the birds once find their way to the seeds, it will be no easy matter to keep them off. When the seeds vegetate, and are a little advanced, they should be carefully gone over and hand-weeded, for, however trifling this may appear, nothing is so injurious to crops of young firs, than to allow them to be overrun with weeds in the first stages of their growth. The earlier this work is performed, the less injury the crop will sustain, and the less time it will take to perform. "A thick rising crop of seedlings," says Sang, "is often converted into a thin one by delaying the weeding: while a thin crop is much improved by a timely and continued attention to weeding. A nurseryman who can neglect his young trees in the above respect, or even walk through his grounds when his young plants languish under weeds, without the severest compunc-

tion exciting him to relieve them, is in no respect entitled to the name which he assumes."

Scotch firs are sometimes transplanted from the seed-bed, when one year old, and put out into nursery-lines, in which they generally remain for two years; but more generally they are allowed to remain for two seasons in the seed-bed, and are then put out into nursery-lines for one year: at the end of that time they are in excellent condition for final planting out. When Scotch firs are allowed to stand more than two years in the seed-bed, they are entirely spoiled, and should seldom be allowed to stand more than one in the nursery-lines. The ground into which young firs are transplanted should be in good condition, and not exhausted by previous crops, and, indeed, if a light manuring be given it previously to their planting, they will be benefitted thereby. During their nursery culture, attention should be paid to keeping them clear of weeds, and in transplanting them to allow not less room than one foot between the lines, and the plant from plant in the line half that distance. When they have been for one year in the nursery-lines, having been transplanted when two-year old seedlings, they will be (if the ground be in a proper state) in much better condition for planting out than at any other age. This tree does not succeed when planted large, and few succeed better when of a proper size and age. Towards improving the quality of this timber, some attention should be paid to the trees from which the seeds are collected. The fir, like most other vegetables, which are continually originating from seeds, must be sporting into varieties, some of which have greater merits than others. This circumstance has given rise to a variety of opinions as to whether there be not several distinct species confounded under the general name of *Pinus Sylvestris*, or Scotch fir.

Amongst the most eminent of those who entertained that opinion was the late Mr. Don, of Forfar, who, in a very excellent paper in the Mem. of the Caledonian Horticultural Society, Vol. II. p. 121, describes several varieties; and we find that notice has been taken of the red-wooded variety by the celebrated Earl of Haddington, who may be considered the father of planting in Scotland. Others again deny the

existence of distinct species, or even varieties, and assert that soil and situation are all that are concerned in the matter. Soil and situation have certainly great influence on the quality of timber, and probably, in no other case, so much as the one in question; but that there exist numerous varieties, if not distinct species of pines in our forests, we think few reasonable men will deny. As a consequence, which must then naturally follow, some of these varieties are better in the quality of their wood than others, and when such can be ascertained, the preference certainly should be given to them, and we doubt not that, by these means, the quality of Scotch fir timber might in future be much improved. The variety preferred by Mr. Don, in the above communication, "is distinguished by the disposition of its branches, which are remarkable for their horizontal direction, and for a tendency to bend downwards close to the trunk. The leaves are broader and shorter than the common kind, and are distinguishable at a distance by their much lighter and beautiful glaucous appearance. The bark of the trunk is smoother than in the common kind. The cones are thicker, and not so much pointed." That distinguished botanist considered this variety as much more hardy, that it grows freely in almost all soils and situations, and that it arrives at a considerable size much sooner than the common sort.

SILVER FIR,

Is a native of the Alps and Germany, and is ascertained to have been cultivated in this country in 1603. It is of very rapid growth while young, exceeding all the pine tribe in this respect, excepting the larch; it attains a very magnificent size, and is peculiarly interesting in an ornamental point of view. Beautiful specimens are to be seen at Woburn Abbey, which were planted by Miller, and at Cranberry-house, and other places. It attains the height of upwards of one hundred feet; and one of the trees at Woburn exceeds nine feet in circumference, four feet from the ground, and has a clean pruned trunk of seventy-five feet. The timber of this tree is in perfection when about forty or fifty years old, and is equally

valuable for most purposes to any other tree of the tribe. In regard to soil and situation the silver fir is not so particular as has been supposed, and is found to succeed on very opposite ones. "In a loamy soil, and elevated situation, (as at Castle Howard,)" Sang observes, "on a sandy or gravelly hill, (as at Woburn,) and in clayey soil, incumbent on till, on a high situation, (as at Panmure,) the silver fir has arrived at a very large size." This tree has not hitherto been much planted merely for its timber, having been considered rather as an ornamental tree than a useful one, but there can be no doubt of its deserving the attention of planters, as the rapidity of its growth, and the value of its timber, which is not liable to warp, are equal to that of any other of the pine tribe.

The cones of the silver fir ripen in October, and should be gathered as soon as ripe, for if left longer they are apt to open and give out their seeds. When gathered, they should be stored by in a dry loft till spring. In April, the seeds should be taken out of the cones and sown in beds in land of a mellow texture, and not exhausted too much by previous crops. In regard to the quantity of seed, it should be regulated in sowing so that the plants may come up about three to a square-inch, or if hardly so thick, the crop may be reckoned sufficiently plentiful. In covering, the necessary precaution must be taken that it be done in a careful and regular manner, so that all the seeds may be of an equal depth; for when this is not attended to, some will be buried too deep, while others will not be deep enough, and both are thereby alike liable to be destroyed. The covering should not be less than one inch in thickness, and when laid on the bed, should be smoothed with the back of a rake, to give the whole a neat and finished appearance.

Silver firs should be allowed to stand two years in the seed-beds, and during that time they should be kept entirely free of weeds. When planted out at that age into nursery-lines, they should be allowed at least nine inches between the lines, and the plants six inches apart in the line, if the intention be for them to remain only for one year in that state; but if they be intended to remain for two years, they should be allowed two-thirds more room. The silver fir, from its habit of growth, requires more room than most others of the same family; and

if they be stinted for room in the first instance, they seldom, if ever, recover. The silver fir requires at least to be nursed for two years from the seed-bed, before it be in a fit state for final planting out, although some plant them when only one year nursed; and, at that size, adopt the slit-method of planting. We would, however, recommend giving them not less than two years in the nursery-lines; and when planted out, to be pitted, as a more likely way of ensuring success. This fir, like most ever-greens, may be safely transplanted at a considerable age and size; but when the object in view is profitable planting, those of the above size will be found, under most circumstances, to succeed the best.

SPRUCE FIR OR NORWAY FIR.—(*Pinus Abies.*)

Is a native of the north of Europe, and is particularly abundant in Norway, and is imported by us from that country under the name of white deal. It is supposed to have been cultivated in this country about 1548, and has been, and continues to be, very generally planted in all parts of the British empire. It is one of the loftiest of our hardy trees, and has been known to have attained 150 feet in height.

This is a valuable tree, considered as a nurse for protecting other trees, as it is extremely hardy, and being ever-green, is calculated for affording a better shelter than the larch, and equally, if not better, than the Scotch fir; but it excels the latter in being much more valuable in its young state, and is peculiarly adapted for masts, spars, scaffolding poles, &c., as its habits in general, whether growing in groups or individually, is perfectly straight and erect.

When grown into a timber size, it is inferior to that of the Scotch fir in durability and bulk; and being often knotty, is less fit for supporting horizontal pressure. In regard to soil and situation, the spruce is by no means difficult to be accommodated; it will grow and thrive in soils of very opposite qualities. It, however, succeeds best in deep loams and low situations. In sheltered situations where the soil is middling good, the timber becomes most valuable. The seeds of this fir are abundantly produced, and ripen in December, at which

period they should be gathered and kept in the cones till April, when they should be taken out and sown in every respect as already noticed for Scotch fir.

BALM OF GILEAD FIR.—(*Pinus Balsamea*.)

Is a native of America, of much smaller and more delicate habits than the silver fir, and of little value as a timber-tree. It is not unfrequently cultivated round the skirts of our plantations and shrubberies as an ornamental tree; and for such situations it is not unaptly calculated, as the tree, during summer, sends out a pleasing turpentine odour, and the resin oozing from the cones has a singular appearance.

In its native country, this species attains the size of a considerable tree; but is not likely ever to become an inhabitant of our forests in the character of a profitable timber-tree. Its seeds ripen freely with us, and should be taken out and sown as directed for silver, and other trees of the same genus.

AMERICAN SPRUCE FIRS.—(*Pinus Nigra, Alba and Rubra*.)

These three species are natives of America, and abound in that country in many different soils and situations. They are imported by us in great quantities annually, under the name of American pine, to distinguish it from Memel or Baltic timber, which is the wood of the Norway spruce.

Of these the black spruce, *P. nigra*, is considered the best and most durable, and is much used in American ship-building. The timber of the red spruce, *P. rubra*, is much prized for sail yards throughout the United States; and, indeed, for the same purpose it is imported into Liverpool from Nova Scotia. Sang asserts that the white spruce, *P. alba*, is a very hardy tree, and will thrive better, and make finer plants in exposed situations than the common or Norway spruce. "It can hardly be admitted," he says, "as a border-tree in a shrubbery or small plantation, because it quickly attains so great a size, and offers to make valuable timber. It is now pretty generally raised from seeds, and is sold in most of the nurseries as a forest-tree." The red and black spruces have been treated with unjust con-

tempt, in consequence of their being in general propagated by layers; a mode of propagation, of all others, the most likely to bring into disrepute any tree, whatever its natural merits may be. The seeds of these species are readily procured from America, and such only should be used in the production of young plants.

In regard to soil and situation, the American spruce will thrive in moist loamy soils and somewhat sheltered situations; yet, in light and dry soils, it attains a considerable size, provided shelter be but very moderate. The white spruce should be allowed to remain for two years in the seed-bed; and when transplanted into nursery-lines, should be allowed a foot distant between the lines, and six inches between plant and plant in the line; and in such lines they should remain for two years, by which time they will, under reasonable circumstances, have attained a size fit for final transplanting. Seeds of this species often ripen in this country, but those from America are always to be preferred. The cones of the black and red spruce also ripen but rarely; therefore the nurserymen chiefly depend on seeds from their native country. The seeds are not difficult to be taken out of the cones; and, indeed, if laid on the floor of a room, spread on paper or cloths before a moderate fire, the seeds will, with little difficulty, be extracted.

When sown in April a rather damp, and somewhat shaded spot should be chosen for them; and when they have been up for two years, they should be taken up from the seed-bed and transplanted into lines, where they should remain two years longer, when they may be considered fit for planting out.

CEDAR of LEBANON.—(*Pinus Cedrus*.)

The cedar has always been considered a most valuable tree, but with us it can be considered scarcely in any other light than that of an ornamental one, although there are many specimens in this country of a large size; still the time which they require to attain that bulk is so long, that they are not likely ever to be planted with an eye only to profit. As an ornamental tree no other excels it; and in situations moderately sheltered, it may be obtained in considerable perfection. It is a native of the

coldest parts of the mountains of Libanus, Amanus, and Taurus, but is not now to be found in those places in any great abundance. We are informed by Maundrell, in his journey from Aleppo to Jerusalem, in 1696, that he could reckon only sixteen large trees of this kind, one of which was twelve yards six inches in circumference, and thirty-seven yards in the spread of its boughs. It is calculated that there are now many more cedars in England than in all Palestine, although only introduced in 1683. The oldest specimens are supposed to be the two in the Apothecaries' Botanic Garden at Chelsea; but there are some of much greater dimensions in various parts of England. Zion House, Whitton Park, Stow, Warwick Castle, and Pain's Hill, are all noted for the size of their cedars; and we have reckoned above one hundred trees in the park at Claremont alone, the majority of which are supposed to have been planted by Lord Clive, and have attained a very considerable size. The cedar ripens its seeds in many parts of England, and from such seeds plants are often obtained; but the best seeds are procured from the Levant, and seldom are found defective, as the seeds will keep quite safe in the cone for several years after being taken from the tree. In regard to such cones as are procured in this country, the seeds should be extracted in spring, by splitting the cones with a triangular instrument; and to facilitate this process the more, the cones may be steeped in water for a day or two before the splitting commences.

The seeds of this tree, unlike that of almost all other trees, are improved by keeping for a time; at least it is found in practice to be beneficial to allow them to lie by for one year at least after gathering, during which time the seeds, which are quite soft when taken from the tree, become hard, and the rosin with which the cones are so fully charged, is gradually discharged. When the seeds are taken from the cone, they should be immediately sown in boxes or pans, in properly prepared light loamy earth, and covered to the depth of half an inch; or they may be sown on a well-sheltered border, in a similar soil, and kept clear of weeds after they come through the ground. When one year old, they should be transplanted into nursery-lines, in which they should remain for two years to gain strength; and afterwards, if they be taken up and replanted carefully

at greater distances, they will, from thence, be fit to plant out, where they are permanently to remain.

The cedar, in most soils, makes few fibrous roots ; hence the difficulty of getting large-sized plants to succeed, and small plants, although ultimately they will out-grow such as may have been planted of greater size, are not always profitably planted, as it is several years before they can at all protect themselves. To remedy this defect, as well as to have a supply of good-sized trees on sale, the best nurserymen grow them in pots from the time they are sown until they are planted, at probably a height of six or ten feet. The seeds are sown in pans, and when fit for removal, are potted into small pots, one plant in each ; as they grow, they are repotted into larger pots, and their leading shoot carefully trained as it advances, so that fine trees may be obtained of a large size ; and the roots being well supplied with fibres, and the ball compact, they may be planted or sent to a great distance with perfect safety. The cedar, like most of the pine family, does not thrive well in the vicinity of large towns : the proper situation for all the species is that of an elevated spot and pure air.

WEYMOUTH PINE.—(*Pinus Strobus*.)

This species is a native of America, and forms the connecting link between the pine and larch tribe. It is a valuable timber-tree in its native country, and attains the height of one hundred feet, but is by far of too delicate a nature ever to lead us to expect it will be beneficially planted here, unless in situations peculiarly sheltered and warm. From its well-known merits as a timber-tree, it has been extensively planted in many parts of the kingdom, but we are not aware of its having succeeded to any useful extent. It was introduced in 1705, and very rapidly spread over the empire, as it was then supposed to be the most valuable tree of the genus, next to *P. Sylvestris*.

The Weymouth pine ripens its seeds in this country, although it is not sufficiently hardy to become a large or useful tree. The seeds are ripe in October, and should be gathered without delay, as they are very liable to drop out of the cones, if left too long on the trees. When collected, they should be laid up in

a dry loft till spring, when the seeds may be taken out and sown in April, in beds of mellow ground, where they should remain not more than two years, and should not be transplanted sooner. A half humid soil is the most favorable for them while in the nursery; and a period of two years nursing in lines fits them for final planting out, where they are to remain. The elegance of this tree renders it admissible into all ornamental plantations. As a single tree, in a sheltered rather damp situation, it becomes a large and handsome tree; but it is only in the grove, when planted closely together, that it is to be looked for as a tree of value. Indeed, such is the case with all the fir tribe, to have fine clean timber-trees, they must be closely planted, so as to shelter, draw up, and prune each other.

It is successfully transplanted when of a considerable size, but always succeeds best when planted out for good when about four years old from seed.

The remainder of this family that are likely to be profitably planted, are the pinaster or cluster pine, (*P. pinaster*), and the stone pine (*P. pinea*); but as neither is equal to those already noticed, we may merely observe that as both ripen their seeds with us about December, their gathering, sowing, and nursery culture are the same as that already laid down for the other species of the *Pinus* genus. The former was introduced in 1596, and the latter in 1570. Its seeds are esteemed a delicacy by the Chinese, as well as the natives of the south of Europe, and appear in their ripe state as an article in their choicest desserts.

SYCAMORE, OR PLANE.—(*Acer-Pseudo-platanus*.)

Is an indigenous tree, and attains a magnitude equal to that of any other of our native trees, and although more tame in its outline and form than the oak, is nevertheless a handsome park tree. It attains a large size in almost all soils which are not over wet, and in almost all situations. In poor dry soils it attains a valuable size; but in a loamy soil becomes very large within a century. Sang says it outlives the ash in elevated situations, and becomes of a very large size in alluvial soils of a

sandy nature. It attains a great age, and is, in that respect, perhaps, next to the oak and yew in point of longevity. Sang instances the *Prior-Letham Plane*, a tree of some notoriety, being one of the *two* trees discovered in Scotland by Dr. Johnson in his Northern Tour. This tree has attained the amazing bulk of twenty-four feet eight inches in circumference at the surface of the ground, and at the parting of the branches nineteen feet. The trunk is twelve feet high, and at that height divides into ten large branches, each equal to a considerable sized tree. It is mentioned in a lease that was granted of these grounds nearly two hundred years ago, and is there called "the large Plane," and cannot probably be less than five hundred years old. The plane succeeds in all ordinary soils and situations, and is, with the elder and larch, the best deciduous nurse plant we have. It is well calculated for a hedge-row tree, as it affords more shelter when grown up than any other tree. It is a quick grower, and will endure the sea breeze better than any other tree, nor is it liable to grow to one side when exposed to winds which blow chiefly in one direction; should it be too closely pressed, and become misshapen by other trees or obstructions, it will, very soon after the removal of the obstruction, assume its own regular form, and become equally poised.

The seeds or keys ripen in September, and are easily procured, but should not be allowed to become too ripe, as, in that state, they are liable to be shaken down by the wind. They should be collected when perfectly dry, and laid by in a dry airy loft, and frequently turned over during the winter to prevent mouldiness or decay. They should be sown in March or April, in light mellow ground; and as the foliage, even of the young plants, is pretty large, they ought not to be sown too thick. Having been one season in the seed-bed, they are in a fit state for transplanting into nursery lines, and when nursed there for two seasons, may be planted out for good. When plants of a larger size are required than those which have been transplanted two years, they should, in that case, be taken up at the end of the second year, and replanted in lines, allowing from one-third to one-half more room between the lines and plants. Sycamores succeed when planted of a considerable size and age, but

in extensive plantations, plants from four to five years old from seed will always succeed best.

There are many species of maple, (to which family the Sycamore belongs,) but none of them are likely ever to be cultivated with a view for timber-trees in this country; and indeed the demand for this timber has been on the decline of late years, since the demand of wooden household dishes has been almost supplied by the superior manufacture of earthenware, and the wood of the sycamore is now used chiefly by the cooper, and in some parts of machinery.

POPLAR.—(*Populus*.)

Of this genus there are several species that may be considered as timber-trees, and are all of them of exceedingly rapid growth; of them the white poplar, Abele, (*Populus Alba*,) is considered one of the most valuable, and with the black, (*P. Nigra*,) the trembling, (*P. tremula*,) and the Lombardy poplar, (*P. dilatata*,) may be considered the most valuable to the profitable planter. The other species merit more general cultivation than they appear to do at present, as they are all extremely ornamental when in selected situations, and under certain circumstances. The wood of all the species is soft, as is the case generally with rapidly growing trees, and although they are upon the whole short lived trees, compared with their neighbours in the grove, yet the wood of them is by no means liable to decay. The wood being soft, is much used by the sculptor, turner, and toy-maker, and occasionally by the cabinet-maker and musical instrument maker. The bark of *P. nigra* is sufficiently astringent to be used successfully in the process of tanning leather.

The Abele may be said to have been principally brought into notice as a valuable timber-tree, by Lord Sheffield, who used it for floors at Sheffield Place, Sussex; and by Ponty, who not only recommended it in his valuable work on profitable planting, but also introduced it in many of the extensive plantations which he has so successfully superintended in various parts of England. The latter, speaking of the above floors, says that, in appearance they “are superior to any other floor he has seen, whether

of deal or oak ; and, as to durability, I see" he says, " no reason to doubt of that, if the density and weight of the article be considered in connection with such testimonies as books afford relative to the point. Floors are, however, only one of the many *inferior* purposes for which it is applicable, as it is certainly proper for almost every article of furniture usually made of mahogany. For the lighter descriptions of it, now so fashionable, it may be made a very good substitute, without any other addition to the natural colour of its heart, than the means cabinet-makers usually resort to, in order to heighten the colour of such wood ; and with respect to the sap, and where more of colour is required, the aqua-fortis stain will instantaneously produce it, so far as that it would be difficult to distinguish it from real mahogany. Indeed it is equal to the best in colour and smoothness of surface, and much superior to the plane, or inferior sorts in those respects, as well as transparency and variety ; and it has the further advantage over mahogany, and most other woods, that it takes but little of either oil or rubbing, to produce upon it the sort of mellow shining surface so much admired in furniture that has been some years subjected to proper attention." The Dutch, in Evelyn's time, had so high an opinion of this tree, that they looked upon a plantation of them as an ample portion for a daughter, and none of the least effects of their good husbandry.

The black Italian poplar appears to have been introduced into this country since the days of Miller, as no mention is made of it in his dictionary ; as a timber-tree it begins now to rank rather high, and is strongly recommended by Ponty, who says it was first sent to Scotland from America, and disseminated through the extensive connexions of the Dicksons and Co. of Hassendean-burn. It is not easily accounted for how it should have obtained the name of black Italian, as it is unknown even in a general cultivated state in that country. This species is an astonishingly quick grower, even, as Ponty observes, " on every sort of soil that may be called tolerable, though it certainly luxuriates most of all in deep fertile ones, while its timber is applicable to purposes sufficiently numerous ; among which is that of making good floors ; and therefore no doubt need be entertained of its always commanding purchasers. In

that sort of planting, which perhaps may be considered the most profitable of all, namely, that which adds to the comfort and consequence, and, of course, the value of a place, before but scantily furnished with that important appendage—wood, this tree is excellent; as, in judicious hands, it may be made to produce very considerable effects, while many others (highly esteemed) would produce them in prospect only. In short, for distant scenery, when wood, not species, is the *immediate object*, this plant, hitherto in many places a stranger, is clearly superior to all the family of the forest.”

The poplar family flower in March and April, and perfect their seeds in about three or four weeks afterwards; but as poplars are seldom originated by seeds, but by cuttings, we need only say that when it is intended to propagate by seeds, they should be sown as soon as gathered, in moderately rich soil, somewhat moist and finely pulverized, and great care taken in covering the seeds, as they are very small and liable to be buried too deep. The mode of originating by cuttings is much the speediest method, and is therefore the most practised. The facility by which even large branches of most of this family emit roots is such, that cuttings of several feet in length and some inches in diameter, are not unfrequently made use of; but to obtain the best trees, to be afterwards planted, cuttings of much smaller dimensions should be chosen. There are a few species which are found to propagate better by layers than by cuttings, among which are the black Athenian (*P. Græca*), and some others. The best cuttings of poplars are taken from the wood of the preceding year, and when made, each cutting should be nine inches in length, and planted in nursery lines eighteen inches apart, and the cuttings about six inches distant from each other. When inserted in the ground, they should be put in deep enough to resist the drought, and if only two inches of the top appear above ground, it will be found sufficient. In two years, or three at most, these cuttings will be fully grown to fit them for being finally planted out; but if they are to remain the third year in the nursery, they ought to be taken up and replanted at a greater distance. The white poplar often sends up naturally vast numbers of suckers from its roots, and such are sometimes used for young plants; cuttings are,

however preferable. Langley asserts, that he has known great quantities produced by chips only, where the trees had been hewed after felling; and one old author has proposed ploughing down these chips with a view to produce an economical copse.

WALNUT.—(*Juglans regia*.)

The walnut-tree is evidently a native of Persia and China, and the Grecian names for its fruit, says Phillips, of "*Perisicon* and *Basilicon*, Persian or royal nut, bespeak it to have been brought from Persia either by the monarchs of Greece themselves, or sent thither from the kings of Persia." The name, walnut, seems to be derived from *Gaul nut*, the seeds or nuts being first imported from France, and the generic name, *Juglans*, from Jovis-glans, a name given them, according to Pliny, by the Romans, and which the Latins translated *Diu-glans*, from whence our *Juglans*. The walnut is one of the trees which was well known to the ancients, and is much noticed by their poets and historians, and many extraordinary virtues are related to have been due to this tree.

It is stated in the *Hortus Kewensis* to have been introduced in 1562, but there is reason to suppose that its date of introduction must be much earlier; for old Gerard, who wrote about thirty years only after that date, says, "The walnut-tree groweth in fields neere common highwaies, in a fat and fruitfull ground, and in orchards." And Turner, in his Herbal, of 1564, speaks of it as being so common as to need no description. It appears to have been extensively cultivated in this country for the sake of its wood, which was almost universally used for all kinds of valuable furniture previously to the introduction of mahogany, which latter circumstance did not take place till the beginning of the eighteenth century. In some parts of Germany, no young farmer is allowed to marry until he gives satisfactory proofs of having planted a stated number of walnut-trees. The walnut has never been very extensively planted in this country, considering the size to which the tree attains, and the usefulness of the timber, and this is the more singular as this timber has been known to have brought very high

prices, particularly during the late war, for the purpose of making gun-stocks. The tree is hardy, and we do not recollect to have seen, even in the north of Scotland, a disposition in this tree to become stunted in growth, where the soil was at all good and the situation sheltered. It thrives in almost all soils that are not too wet, but it attains the greatest bulk in such as are rich and deep; but the timber on such as are thin and poor, is far more valuable, although less in bulk. In loamy or light clayey soils, it attains a good timber size within a century; and for gun-stocks, for which it is prized above all other woods, it is fit at fifty years' growth or sooner. As an ornamental tree, the walnut has very just pretensions; the general habit of the tree, as well as the beautiful lobed leaves, associate well with garden scenery. It is fit for the decoration of the lawn or the park as a single tree, but when valuable timber is in view, it should be planted in the grove fashion, so that one tree may draw the other up. The best specimens of this tree that we have observed, have, to all appearance, been so drawn up; and when cleared, at a proper age, of the surrounding trees, have become magnificent objects.

Walnuts produce their seeds in most seasons in this country, and by that means are readily increased. The nuts or seeds ripen in October, and should be gathered, and either sown immediately or packed in boxes of sand till the spring. Upon this subject Miller observes: "All the sorts of walnuts which are propagated for timber, should be sown in the place where they are to remain; for the roots of these trees always incline downwards, which being stopped or broken, prevent them aspiring upwards, so that they afterwards divaricate into branches, and become low spreading trees. But such as are propagated for fruit are greatly improved by transplanting, for thereby they are rendered more fruitful, and the fruit is, therefore, larger and better. It being a common observation, that downright roots greatly encourage the luxuriant growth of timber in all sorts of trees, but such trees as have their roots spreading near the surface of the ground are always the most fruitful and best flavored." Evelyn, who wrote previously, says, that those who plant nuts for the sake of the fruit, should

place a tile below the nut, that the roots may be obliged to spread out horizontally.

The nursery practice of rearing walnuts, is to sow the seeds either when gathered or in the February or March following, in beds of moderately rich ground, and the trees are managed similar to those which have originated in the same way. In transplanting walnuts, either in the nursery or at a future period of their growth, great care should be taken that their roots be as little injured as possible, neither should their branches be broken upon any account, both of which is injurious to them. The best time for transplanting them is in autumn, as soon after the foliage drops as possible; and trees of a small size, let it be remembered, will succeed better than such as are large. The walnut seems impatient of pruning, and is, upon the whole, more injured by an application of the knife than an almost total neglect of it. The pruning of nature is the best for this tree, in common with several other forest trees; and if planted in the grove manner, either by themselves or along with other trees, the lashing of each other's branches will be sufficient to effect what the pruning-knife never could have done, without evident injury to the timber.

WILLOW.—(*Salix*.)

Although some species of willow attain the size of timber-trees, by far the greater portion of them are small shrubs, and only fit for cultivating in osier grounds. Of those that attain a timber size may be noticed, as the best, *Salix alba*, the Huntingdon willow, and *Salix Russelliana*, the Bedford willow. The upland willow of Ponty, appears to be only a variety of the former, and is distinguished by its silvery-like leaves and deep red shoots.

The Huntingdon willow attains the size of a lofty tree, and seems common over all Europe, being found both in a natural and cultivated state in Russia, Sweden, and Italy. The Bedford willow is so called in compliment to His Grace the Duke of Bedford, who is an enthusiastic encourager of every thing connected with rural economy and the arts. The Woburn

collection of willows is amongst the richest in the kingdom. This latter tree has a great resemblance to the former, in general habit, and like it, is a very rapid grower, and soon attains a great bulk of timber. The willow tribe, considered as timber-trees, have hitherto been much neglected, and as Ponty very justly observes, "This plant, though well known as a pollard, has been very little cultivated as a timber-tree, and hence furnishes a striking instance of the supineness of mankind in regard to the properties of many sorts of wood. Every one knows the willows are quick growers, and yet it is considered a sort of heresy to suspect that the wood of any of them can be at all durable. There is, besides, an objection to this willow, inasmuch as it usually divides itself into a number of large arms before it acquires any tolerable length of stem: this defect is to be entirely imputed to ignorance or inattention, as few trees require so little management to be made grow with a long clean and straight trunk." In regard to ornament, this willow is not without its share; and, as Sang observes, "Were the Huntingdon willow not so very common, and so frequently met with in low or mean scenery, it might perhaps be reckoned more ornamental than many of the other kinds. They certainly are very elegant plants while young and in middle age; and if not picturesque when grown old, yet there is something very striking in their hoary and reverend appearance."

Willows are naturally found in damp situations, by the sides of rivers, lakes, or brooks, and in such situations are successfully and profitably cultivated; as no other tree, the alder excepted, would grow in such situations. The Huntingdon willow, however, will prosper in situations perfectly dry, and even elevated; and, if planted in the grove manner, will make, next to the larch, probably the quickest return of any other tree. Its bark is used in tanning, and contains about the same proportion of astringency as the birch or mountain-ash. The timber of the willow is used in turnery, machinery, and by the cooper, both for staves and hoops.

To the willow-planter we may add, that the following are and may be profitably planted in situations too wet for other trees to succeed in:—The golden willow (*Salix vitellina*); triandrous willow (*Salix triandria*); the common osier (*Salix*

viminalis); the green osier (*Salix rubra*); the cared willow (*Salix stipularis*); the basket willow (*Salix forbyana*); and the velvet osier (*Salix mollissima*): these are valuable willows, and in most situations will pay better than any other plant. The two-year-old shoots of the second and last sorts are valued by the basket-maker; and those of one year's growth of the others are in equal request. They are all propagated by cuttings which root freely, and plantations of them are often formed in this manner: Willows are generally planted by being pushed into the ground by the hand, which must be well defended by a piece of strong leather; but sometimes in pushing in the cutting, the bark is pressed off. In order to prevent this, it is better to use a common dibble, shod with iron, and have them planted by it like ordinary planting in the nursery. Where the ground is any way hard, or where there is a danger of pushing off the bark, they should be planted so as to leave five or six inches above ground, that when it may become necessary the top of the stools may be cut off, in order to renovate them. This may happen to be in ten or twelve years after planting, and the practice will be found of considerable advantage. It is a matter of indifference whether cuttings be planted in a sloping or perpendicular position.

Having noticed the propagation of the useful forest-trees cultivated in this country, with a view to profit as well as ornament, we will now proceed to notice the various methods of propagating such as are planted for ornament alone, or do not attain a size, under ordinary circumstances, in this country, to warrant their admission into the forest.

YEW.—(*Taxus Baccata*.)

The yew is a native of many parts both of England and Scotland, but particularly the former, and is a tree of great longevity and hardihood. It is most generally found in stature little other than a large shrub, but, as Sang justly observes,—“Whoever has seen that at Tortingale, and those at Kincardine in Perthshire, and at Himley Hall in Staffordshire, will allow an aged yew to be a very picturesque tree.” The

former of these trees we have more than once measured, and found it to exceed fifty-seven feet in circumference, an increase of about five feet since 1770; about which time it was measured by the Hon. Judge Barrington, and by him stated to be fifty-two feet round.

As an ornamental tree, the yew has considerable pretensions, and as such we find it generally admitted into the best laid out pleasure-grounds. It makes excellent hedges, and it appears to have been much more generally used for that purpose formerly than now. "No plant," says Sang, "is better adapted for underwood than the yew; it will thrive under the drip of other trees equally with the holly. A grove of yew-trees, in a recluse corner, would be a solemn passage to the grounds of a place. As the cypress in the East, the yew in Britain, has been appropriated to the decoration of sacred ground from time immemorial: it is therefore a fit accompaniment to the temple and the mausoleum." Such appear to have been the ideas of our forefathers, and hence we find these trees in church-yards, and near places of worship, of a vast size, and often in considerable numbers, even in parts of the country where it is almost otherwise unknown. This circumstance has been often noticed, but never satisfactorily accounted for; some asserting that the branches of this tree, used on Palm-Sunday, and other days, for the decoration of churches, gave it a place near at hand; while others, with less probability of truth, suppose the yew to have been planted near churches to afford materials for cross-bows, should the congregation be surprised by an enemy. The sombre appearance of its dark green foliage may be supposed emblematical of eternity, and, like the cypress of the ancients, has given it a place near the resting-place of the dead.

The yew ripens its berries, or seeds, annually with us in October, when they should be gathered and deposited in the rot-heap, mixed with sandy earth, and there left till the September or November following, when they should be sown in beds of rich, well-broken mould, and should be allowed to remain in the seed-bed for two years before they be planted out into nursing-lines. Yews are also often increased by cuttings, and sometimes by layers. Cuttings of the young wood

root freely; and having been once rooted, they should be transplanted out into nursing beds or lines to attain sufficient size, age, and strength, for final planting out. Yews will succeed, although planted of a large size, and such are often planted for particular purposes; but, when extensive plantations are intended, plants from eighteen inches to two feet will always succeed best. It is but seldom, if ever, that this tree is planted to any considerable extent with a view to attain a timber size; but, although a slow growing tree, circumstances may warrant, in favorable situations, extensive plantations to be made, as the timber is valuable when of a large size, and of great durability.

ORIENTAL PLANE.—(*Platanus Orientalus.*)

This is a very interesting and highly ornamental tree, and, although not suited for extensive cultivation in this country, it is nevertheless a tree which should be found on every lawn, where any thing like decorative planting is attempted. It is sufficiently hardy to withstand our severest winters, and has stood those that have killed trees considered of a much hardier nature. The Oriental plane is a native of the Levant, from whence it was introduced here in 1518. The Romans introduced it from the same place to Italy, and spared neither cost nor pains in its cultivation. Cicero and Hortensius are said to have been so partial to this tree, that they spent much time in attending to its cultivation; and to such an extreme did they carry their regard for it, that they are said often to have poured wine to its root instead of water. This tree, in favorable situations, ripens its seed in England, and is, by that means, increased by those who take the trouble of rearing trees from seeds. It is, however, by far the most frequent, but less rational practice, to increase it by layers, which root freely, and make larger plants in less time than seedlings, but the former never make such fine trees as the latter. The seeds should be looked for in fine seasons in October, and gathered when ripe. They should be sown as soon after they are gathered as possible; and if put into a fine pulverized rich soil, will make their appearance in due time, in March or April

following. When the process of laying is to be adopted, it should be done in October, and will, by the autumn following, be well rooted, when they should be taken off the stools, and planted out in nursery-lines to get strength. As the foliage of this tree is large, it is therefore necessary to allow it plenty of room in the nursery; say, from twenty inches to two feet between the lines, and from a foot to eighteen inches from plant to plant, in the line. Ælian, and other authors, have given strange accounts of this tree; such as the effect it had on Xerxes, at the head of his army, and his having medals of gold stamped with its figure, which he carried constantly about his person. The Licinian *Platanus* has been recorded to have exceeded eighty feet in circumference, and capable of accommodating within its trunk the Consul Licinius Mutianus and his retinue. It has not ever attained any extraordinary bulk in this country, and, considering its early introduction, may rather be considered a rare tree, particularly as it has not fallen a sacrifice to the severity from climate like the following.

AMERICAN PLANE.—(*Platanus Occidentalis.*)

A much tenderer species than the last, and introduced here from America, as the name implies, in 1640, about one hundred years after the Eastern Plane. This, like the last, attains an enormous size in their native countries, but with us can only be reckoned upon as a tree of the third or fourth class of magnitude, and limited to the lawn or more sheltered parts of the park. The almost general destruction of this species by frost, about the middle of the last century, and the partial loss of many others in 1809, have alarmed planters from propagating this tree so extensively as could have been wished. Many trees of this species, of a considerable size, existed previously to the first of these disasters in many parts of England, as at Sion-House, Pain's-Hill, Kew, Stow, and some other places, but which fell a sacrifice to the inclemency of our climate. And, in 1809, almost all the trees of a large size of this species were killed, while those from twenty to twenty-five feet were not materially injured, and those of a smaller size were not injured at all. The winter's

frost does not seem to injure them so much as the late frosts in spring, and the occasional ones of summer, as was the case in 1809, when the frost of June, which was unusually severe, just as the trees were coming into foliage. The leaves were killed, and the trees pushed, late in the season, into a second foliage and shoots, which were killed by an early autumn frost. The trees made an effort to push in the spring following, but failing, finally languished and died. The seeds of this species ripen more freely in this country than the last species, and should be collected in October when they are ripe, and sown immediately, by this means plants are to be obtained in plenty; but nurserymen seldom originate them by this means, and have recourse to the process of laying, and sometimes by cuttings. Cuttings, if put in, in autumn, succeed pretty well, and may be by the autumn following expected to be sufficiently rooted for planting out into nursery-lines; and layers, laid down in autumn, will also by the autumn following be sufficiently rooted to be fit to plant out in lines also. When cuttings are to be made use of for propagating this tree, those shoots of the last season's growth which are well ripened should only be made choice of, and should be from nine to twelve inches in length. These, if planted in moderately rich ground, will root freely, and make fine plants.

ORNAMENTAL PINES.

Under this head may be included a number of extremely curious and interesting species of the *Pinus* genus, which, either from their delicate habits, diminutive growth, or other circumstances, render them unfit for planting in the general plantations, and are generally admired and most in character when planted singly on the lawn, or in systematic order in the arboratum, &c. So numerous and interesting is this genus, that they may be said to form of themselves a very complete and interesting collection, and as such have been exemplified at Dropmore, the seat of Lord Grenville, where there is the finest collection in cultivation in Europe, and contains fifty-two species, including the three species *Araucaria*, *Cunninghamia*, and *Dammara*, to which they are nearly allied, and which are

of extremely interesting habits, and if naturalized into our pleasure-grounds, would materially alter their characters in a pictorial point of view. The majority of these are to be propagated from seeds imported from their native countries, when they do not ripen with us; and when such cannot be obtained, recourse must be had to the usual modes of propagation, namely, by layers and cuttings, and probably some species might be increased by grafting or inarching. Seeds are the natural mode of propagation, and always succeed best, and make by far the finest trees. But seeds of many of the rarer species are difficult to be procured, and some lose their vegetative property before they can reach this country.

Several species of this genus will strike roots by cuttings, but they seldom form a leading shoot to give them the character of a future tree. Such is the case with *Pinus lanciolata*, now *Cunninghamia lanciolata*, which may be said to root by cuttings freely, not one in ten of such plants, if left to themselves, will ever form a proper leader. It has been suggested, and indeed almost proved, that plants so originated when cut down to the collar, or to that part which may be said to divide the root from the stem will shoot out proper shoots from which a leader may be selected, and which will form a future tree. The celebrated *Araucaria excelsa*, when propagated from a cutting, the only method of increasing it in this country, continues little other than a branch, but is said to be completely altered in its character by a similar process. It has also been suggested, that if those plants which have been increased in this manner be laid down at their whole length, and their principal stem bent so as that several parts of it will protrude through the surface, that upright shoots will be sent up from such parts that will form proper leaders; when such is the case, and when the parts under ground have emitted sufficient roots, they should be separated by cutting the original leading branch into pieces, each of which will form a future tree. So desirable a tree as this, and one that, if once acclimated to our sheltered lawns, would be so very ornamental, deserves all our care in order to propagate it, and likewise to protect it should it once be increased. One of this genus, *A. imbricata*,

has for several years stood out in the Royal Gardens at **Kew**, and has only to be seen to be admired.

Cunninghamia lanciolata, of which the annexed wood-cut engraving is a very faithful representation, and drawn on the spot expressly for this work, has stood out in the pleasure-grounds at Claremont for twelve years, and one of them has attained the height of sixteen feet, and nearly as much in diameter through the branches, and is supposed the finest specimen in the kingdom.



Pinus longifolia, a native of the East-Indies, has stood out at Dropmore seven or eight years; *P. sinensis*, a na-

tive of China; *P. canariensis* is from the Canary Islands; *P. excelsa*, from Nepal, in the same collection, are thriving trees.

There are many others, although sufficiently hardy to stand unprotected in our climate, that are almost unknown to the generality of our pleasure-grounds, of these may be noticed the Hemlock Spruce, *P. canadensis*, from North-America, where it attains a very great size, both in altitude and diameter, but with us only that of a large shrub or very dwarf tree. It is exceedingly ornamental, but to be such requires to be planted in rather a moist and shaded situation. In dry exposed places, it seldom looks healthy, and is apt to divide into too many irregular branches, and seldom to attain a leader amongst them. It is propagated by seeds, which are imported annually from America, and should be sown in March or April, in finely prepared, rich, light mould, in shallow boxes or pans, and placed in a frame or shaded situation. During summer, they should be regularly supplied with water, and the spring following the sowing they may be transplanted out into lines, at the distance of one foot apart, and six inches apart in the line. If it be wished to obtain large plants of this species, they will require to be once or twice taken up during their stay in the nursery, and again transplanted, allowing more room between the plants each time.

The *Pinus cembra*, Siberian stone-pine, is also a rare plant, comparatively speaking, in our pleasure-grounds, and exceedingly ornamental in all its stages of growth, particularly when it attains a considerable size. It is of slow growth in all situations, but sufficiently hardy, as its name implies. It is propagated from seeds, which are occasionally imported, and there is reason to hope that a sufficient supply may be yet obtained from trees in our own country. Such trees as those at White Knights, Claremont, and Powis Castle, are very likely to produce seeds, as they have attained both size and age sufficient to lead us to expect such a result.

A Calculation of the number of Plants requisite to plant an English acre of ground, according to their sorts and sizes; the plants at the under-mentioned distance. Also, the number of rods, yards, and feet, when let to labourers to trench, or to prepare for planting.

Feet apart.	No. of Plants.	Feet apart.	No. of Plants.
1	43,560	10	435
1½	19,360	11	360
2	10,890	12	302
2½	6,969	13	257
3	4,840	14	222
3½	3,556	15	193
4	2,722	16	170
4½	2,232	17	150
5	1,742	18	134
6	1,210	19	120
7	889	20	108
8	680	25	69
9	537	30	48

An English acre contains 160 rods or poles, 4,840 yards, 43,560 feet.

In planting upon an extensive scale, the ground is generally prepared by task-work: draining by the rod; trenching by the acre, rod, or pole; and planting sometimes by the hundred or thousand, and also by the rod or acre. The preparation of the ground may almost always be with economy done in this manner; but in regard to planting, at least putting in the trees, it may be expected to be better done by day-work. The pits or holes, however, when the trees are so large as to require that mode of planting, may be done by the hundred, thousand, or by the acre, pole, &c.

In purchasing hardy trees or shrubs, the former, particularly forest-trees, are bought by the thousand, when small; by the hundred, when larger; and, when very large, by so much per tree. Shrubs of the most common kinds are purchased by the thousand or hundred; and when new, rare, or expensive, by the individual.

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